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CIVIL DEFENSE RESEARCH

CDR

UNIVERSITY OF GEORGIA

Civil Defense Research
Margaret Hall
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Athens, Georgia

31 December, 1964

APPENDICES

SHELTER OCCUPANCY STUDIES
at the University of Georgia

1964

Prepared for
Office of Civil Defense
Department of Army - OSA
under
Contract No. OCD-PS-64-77
Subtask 1521A

UNIVERSITY OF VE
CIVIL DEFENSE

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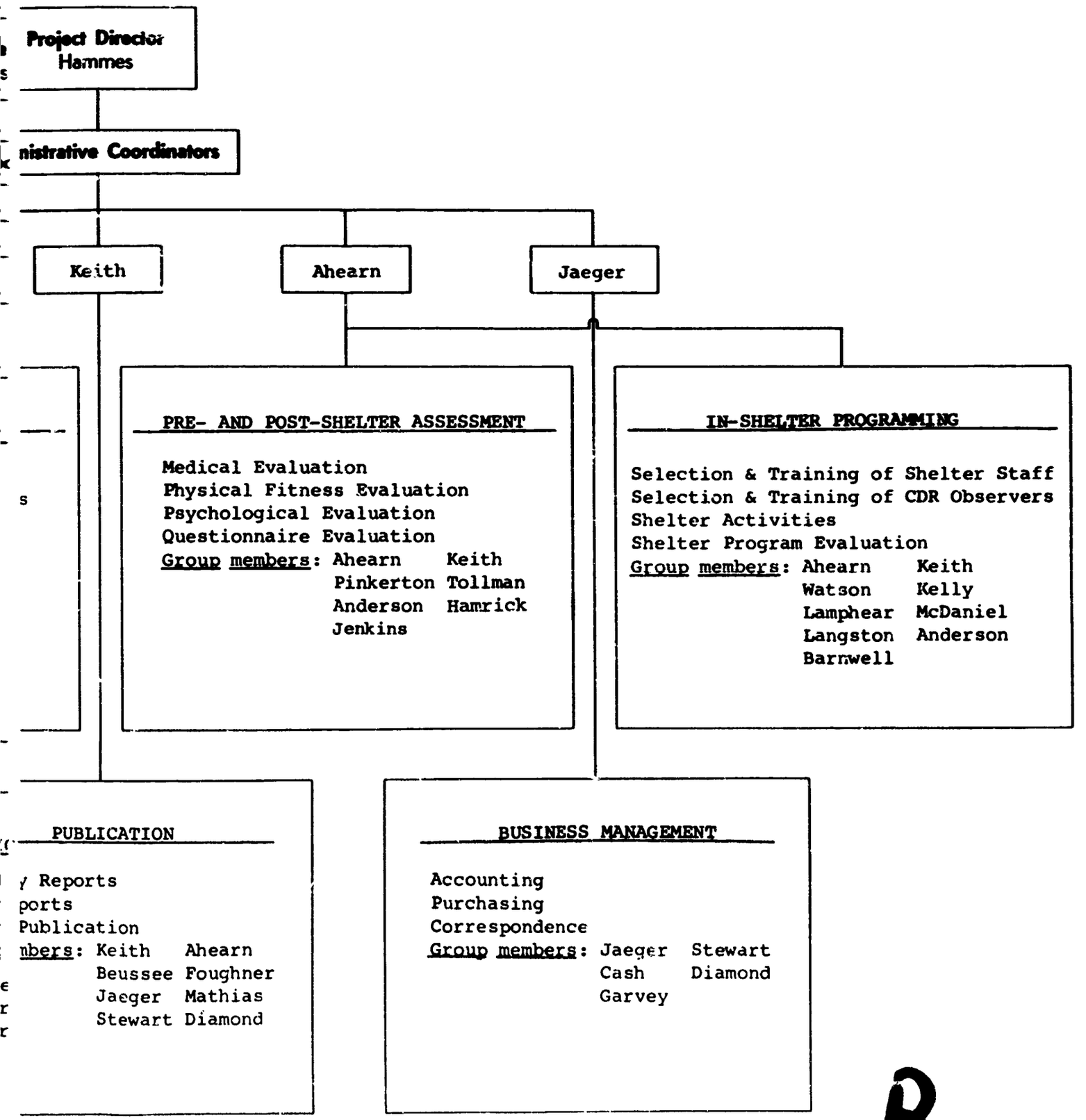

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Outline of Appendices *

Appendix A - Experimental Study V

Appendix B - Experimental Study VI

*These Appendices are based on Quarterly Reports issued at the time the studies were implemented. In event of Discrepancy between Final Report information and Appendices information, the former should be regarded as having precedent.

Appendix A

Experimental Study V

Table of Contents

ABSTRACT

From 8-21 February, 1964, a 13-day simulated fallout shelter occupancy test was conducted by the University of Georgia Psychological Laboratories. This test was the fifth in a series of such studies. Its primary purpose was the evaluation of shelter survival without a trained shelter manager. Other purposes included relative food preference tests, commode chemical tests, and cognitive vigilance tests.

Thirty shelterees, 15 males, 15 females, aged 7-70, participated. Stress conditions included restricted food and water rations, minimal living space (8 sq. ft./person), a chemical commode, reduced ventilation, and sleeping accommodations of corrugated fiberboard placed over a concrete floor. Restricted quantities of the bulgur wheat wafer, Nabisco wheat-flour biscuit, Nebraska wheat-corn-flour cracker, and carbohydrate supplement composed the survival rations. A new commode chemical, phenol, was tested.

The shelter manager was appointed, although he received no prior training in management methods or familiarization with shelter material. A Shelter Manager Handbook, with additional instructional material, was stocked with the OCD shelter supplies. The handbook provided information on use of stocked items, as well as a suggested daily activity and training program. One shelteree was given prior information on means of keeping experimental records, for purposes of test evaluation.

General Conclusions:

1. The 13-day study, the third of such duration conducted at the University of Georgia, once more demonstrates the capability of healthy men, women, and children to endure a two-week survival period under conditions of severe austerity.

2. The group under study completed the test successfully without the aid of a trained shelter manager.

Specific Observations:

1. Water intake averaged 1.04 qts./person/day. Food consumption averaged 808 cal./person/day.

2. Of the three survival cereal rations, the Nabisco biscuit was the most preferred, with the bulgur wafer and Nebraska cracker being next and equally preferred.

3. The commode chemical, phenol, proved satisfactory.

4. Eight defections occurred during the study. Primary reasons were first, inability to adjust, and second, colds.

5. Cognitive vigilance, in terms of visual and auditory signal detection tasks, showed no deterioration during shelter confinement.

List of Tables

I. Introduction

The study described in this report, implemented 8-21 February, 1964, is the third two-week study, and the fifth in a series of simulated fallout shelter occupancy studies being conducted at the University of Georgia. The investigation herein reported will be referred to as Experimental Study V.

II. Experimental Design

A. Purpose

Experimental Study V was designed to evaluate the variables listed in Table 1.

Children were permitted to bring in textbooks, paper, and pencil for school purposes. All shelterees were permitted one change of underwear and socks or stockings, and toilet articles such as toothbrush, mouthwash, and handbag cosmetics.

The primary purpose of ES V was to evaluate the use of a Shelter Handbook in a shelter not having a trained shelter manager. Consequently, a shelter manager (SM) was selected but not trained prior to entry.

The second purpose of ES V was to obtain a relative preference ranking of the three basic cereal rations: the bulgur wheat wafer, the Nabisco wheat-flour biscuit, and the Nebraska wheat-corn-flour cracker. These rations were respectively randomized on a daily basis, *e.g.*, the biscuit one day, the cracker the next day, the wafer the third day, *etc*. The daily caloric ration consisted of 600 calories of the basic cereal ration plus 300 calories of the carbohydrate supplement.

A third purpose of ES V was to evaluate certain commode chemical tests (see Table 3). Lastly, a fourth purpose was to assess the effect of stressful shelter confinement on cognitive vigilance, as measured by visual and auditory signal detection tests.

B. Shelterees

The subjects who participated in Experimental Study V were selected randomly from a pool of 1,321 applications. The fifteen males and fifteen females in the experiment ranged in age from 7 to 70. The mean educational level of the 20 adults was 10.4 years (see Table 2).

Table 1

Variables Investigated in Experimental Study V
(8 - 21 February, 1964)

Shelteree Characteristics

Number - Thirty (30), including a designated but untrained SM, and a registered nurse
Age - 7 to 70
Sex - 15 males, 15 females

Shelter Environment

Space - 8 sq. ft./person (52 cu. ft./person)(includes latrine area)
- 1 cu. ft./person storage additional
Temperature - optimal
Humidity - optimal
Ventilation - (a) night: 15 cfm/person from hours 2200-0800 (3 cfm fresh air, 12 cfm recirculated air); (b) day: 40 cfm/person from hours 0800-2200 (8 cfm fresh air, 32 cfm recirculated air)

Shelter Supplies

Shelter Handbook and Material
Water - 1 1/2 qts./person/day provided
Food - 900 calories/person/day provided: (a) 600 calories consisted of wafer, biscuit, or cracker; (b) 300 calories consisted of the carbohydrate supplement
Sanitation - Sanitation Kit III used with specified commode chemicals
Medication - Medical Kit A
Radiological Kit
Bunks - none; slept on concrete floor covered with 3/16" corrugated fiberboard
Blankets - none
Bible
Recreational materials - none other than pencils and children's school texts
Washing water - none
Coffee - none
Cigarettes - one pack, or equivalent in cigars or pipe tobacco

Table 2

Educational and Occupational Characteristics of Shelterees
(Experimental Study V)

Shelteree Number	Sex	Age	Education (years)	Occupation
1*	F	7	1	Student
3*	F	9	2	Student
5*	F	12	4	Student
33	F	13	7	Student
9	F	16	10	Student
37*	F	38	10	Textile Machine Operator
13	F	41	13	Public Health Nurse
15	F	30	16+	Teacher
17	F	37	11	Housewife
19	F	35	12	Practical Nurse
21	F	46	10	Housewife
23	F	53	10	Cashier
25	F	51	13	Public Health Nurse
27*	F	60	7	Housewife
47	F	63	11	Retired
32	M	9	3	Student
4	M	8	1	Student
6	M	10	4	Student
8	M	13	6	Student
34	M	13	7	Student
12*	M	20	8	Mechanic
14	M	31	16	Naval Officer
36	M	24	10	Laborer
50	M	22	16	Naval Officer
44	M	44	2	Grocery Clerk
22	M	46	8	Construction Worker
24	M	51	6	Lumber Yard and Poultry Plant Worker
26*	M	56	7	Mechanic
28*	M	64	16	Tax Consultant
30	M	70	6	Farmer

*Early exit.

Table 3

Commode Chemical Tests
(Experimental Study V)

Test	Commode Chemical
No. 1	Weladyne as prescribed by OCD
No. 2	Dry Phenol

Volume	Water	Phenol
0	2 qts.	2 ounces
1/3	--	1 ounce
2/3	--	1 ounce

Instructions:
The dry phenol should be gently poured into the commode, at arm's length. The package should not be tapped or shaken. The emptied package should be dropped into the commode. Avoid generation of dust and skin contact.

If no complaint, continue No. 2 throughout study.

If complaint, conduct Test No. 3.

No. 3 — Phenol and Mineral Oil

Volume	Water	Phenol	Mineral Oil
0	2 qts.	2 ounces	1/2 pt.
1/3	--	1 ounce	1/2 pt.
2/3	--	1 ounce	1 1/2 pts.

If no complaint, continue Test No. 3.

If complaint, conduct Test No. 4.

No. 4 — Sodium Perborate, Mineral Oil, Boric Acid (or Cupric Sulphate)
(Tests No. 6 and 7 of Experimental Study IV)

Three shelterees were chosen for particular duties. The shelter manager was a 31-year old Navy lieutenant (j.g.), stationed at the U. S. Naval Supply Corps School in Athens. Although designated as manager, he received no specific management training. Another shelteree, also a Naval Officer, kept experimental records (food and water consumption records, vigilance task, etc.). The shelter nurse was a 51-year old public health nurse.

C. Pre- and Post-Shelter Testing Procedures

Pre- and post-shelter testing consisted of a medical examination and psychological evaluation.

1. Medical Examination

In addition to an initial screening medical examination by the family doctor, each subject was examined just prior to shelter entry by a consulting physician. This final examination included a check of the heart, lungs, temperature, pulse rate, blood pressure, and respiratory tract. Blood and urine analyses were also conducted.

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2. Psychological Test Battery

The California Capacity Questionnaire (CCQ) was used for the appraisal of intellectual functioning in adults. This test is designed to sample major mental factors, viz, perceptual ability, memory, spatial orientation ability, mathematical reasoning and inference. A modified version of the Minnesota Multiphasic Personality Inventory (MMPI) was used in assessing adult personality characteristics.

The Henmon-Nelson Test of Mental Ability was used for the appraisal of intellectual functioning in children. This test is designed to measure those aspects of mental ability important for academic success. The California Test of Personality (CTP) was used in assessing personality characteristics of the children, and in evaluating personal and social adjustment.

3. Pre-Shelter Questionnaire

A Shelter Entrance Questionnaire was given prior to shelter entry to determine general information on anticipations of shelter experience, as well as preparedness for a nuclear emergency.

D. Behavioral and Environmental Measures

1. Observers and Observational Forms

Continuous 24-hour observation was maintained by 2-man observer teams on 3-hour watches. One observer monitored the instrumentation, while the other kept a continuous log of these shelter activities: (a) shelterees emerging as dominant figures or withdrawing as recessive figures; (b) group activities such as lectures, training, etc.; and (c) use of shelter equipment, e.g., corrugated fiberboard mats, cups, medical kit items, water and food dispensing methods, etc.

2. Environmental Measures

Environmental measures included temperature changes, humidity variations, and general activity levels.

3. Commode Chemical Tests

The plan for commode chemical testing is presented in Table 3. Only two of these tests were conducted.

4. Cognitive Vigilance Task

Every subject was required to perform a vigilance task for a 25-minute period on each of nine consecutive confinement days (days 3 through 12). The task required simultaneous monitoring of visual and auditory signals. The visual signal was an increase in intensity of any one of 10 lights on an enclosed panel. The auditory signal, presented through earphones, consisted of a brief 120-cycle tone presented over a low intensity 60-cycle tone. The subject identified the presence of a signal by pressing respective response switches for visual and auditory signals.

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E. In-Shelter Program

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The shelter manager was briefed on the experimental aspects of the study. However, he was not familiarized with the equipment and supplies, nor the shelter itself. In lieu of the training which previous managers had received (see University of Georgia Shelter Occupancy Studies, Final Report, Dec., 1963), the manager for ES V was permitted use of a shelter

management handbook and materials stocked in the shelter. This handbook was designed to assist the untrained manager in organizing and operating a small community fallout shelter. It contained an activity and training schedule, as well as suggested recreational and training material (see Table 4 and Table 5).

F. Schedule of Events

Arriving at the Psychological Laboratories at 8:30 AM on 8 February, 1964, the shelterees were received by staff members and oriented on the day's proceedings. Medical examinations were followed by physical fitness and psychological testing. Later in the day, the group was addressed by the Project Director on the national significance of the study. At 1:30 PM, the shelterees entered the shelter.

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III. Results

A. In-Shelter Test Results

1. Experimental Variables

a. Shelter Handbook

The handbook with instructional materials appeared to provide adequate direction for adjustment to the shelter conditions of the present study (see Shelter Manager Report). Staff observation indicated, however, that many modifications are needed, and that further experimental validation is necessary.

b. Water and Food Consumption

Water consumption averaged 1.04 qts./person/day, and food consumption averaged 808 cal./person/day. Detailed water and food consumption data are presented in Tables 6-11.

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Table 4

Weekday Schedule
(Experimental Study V)

Time	Activity
0730 - 0830	Arise - personal grooming, shelter clean-up, group exercise
0830 - 0900	Breakfast, announcements for day
0900 - 1100	Diaries, school for children, quiet activities or conversation for adults
1100 - 1200	Active group games
1200 - 1230	Lunch
1230 - 1400	Rest period
1400 - 1430	Exercise, active games
1430 - 1530	Training (lecture and discussion)
1530 - 1600	Afternoon snack
1600 - 1700	Planning for special activities, school
1700 - 1800	Active games, exercise, free time, SM Staff conference
1800 - 2100	Dinner, special events, singing
2100 - 2300	Diaries, shelter clean-up, preparation for sleeping, vespers, story-telling
2300	Lights out, quiet

Table 5

Schedule of Training Lectures
(Experimental Study V)

Day	Topic
1	How to Adjust to Shelter Life
2	Psychological First Aid
3	The Bomb: The Effects of the Bomb
4	What is Fallout?
5	Fallout Detection Equipment
6	National and Community Warning Systems
7	Radiation Sickness
8	Miscellaneous First Aid Techniques
9	Care for the Sick
10	Wounds
11	Sanitation
12	Decontamination (I and II)
13	Preparation for Leaving the Shelter

Table 6

Daily Mean Water Intake
(Experimental Study V)

Confinement Day	Men*		Women*		Children*		Total Group	
	Cups	Ounces	Cups	Ounces	Cups	Ounces	Cups	Ounces
2	4.7	28.2	4.9	29.4	4.5	27.0	4.71	28.3
3	5.0	30.0	5.0	30.0	5.0	30.0	5.00	30.0
4	5.0	30.0	5.0	30.6	5.0	30.0	5.00	30.0
5	6.0	36.0	6.0	36.0	5.9	35.4	5.96	35.8
6	6.0	36.0	6.0	36.0	6.0	36.0	6.00	36.0
7	6.0	36.0	6.0	36.0	6.0	36.0	6.00	36.0
8	6.0	36.0	6.0	36.0	5.6	33.6	5.88	35.3
9	6.0	36.0	6.0	36.0	6.0	36.0	6.00	36.0
10	5.9	35.4	5.7	34.2	5.9	35.4	5.78	34.7
11	6.0	36.0	5.9	35.4	6.0	36.0	5.95	35.7
12	5.9	35.4	5.2	31.2	5.8	34.8	5.59	33.5
13	5.1	30.6	4.9	29.4	5.0	30.0	5.00	30.0
Mean	5.6	33.6	5.55	33.3	5.54	33.2	5.56	33.4

*Respective age ranges for men, women, and children were 16-70, 16-70, and 7-15.

Table 7

Daily Mean Caloric Intake of Cereal and Carbohydrate Food Rations (Experimental Study V)

Confinement Day	Men	Women	Children	Total Group
2	869.0	800.9	789.0	821.9
3	777.8	704.9	799.5	755.8
4	853.3	859.4	915.9	872.5
5	688.6	738.3	706.5	712.7
6	913.6	836.6	832.2	862.4
7	721.6	640.7	586.6	655.6
8	815.1	825.5	810.6	818.1
9	754.1	816.0	857.2	839.7
10	769.5	755.3	1,127.7*	862.6
11	796.0	794.3	878.5	817.4
12	804.2	732.8	941.4	812.4
13	774.7	715.1	1,209.2*	868.8
Grand Mean	794.7	768.3	871.0	808.3

*Unusually high caloric intake affected by excessively high daily rations for two younger males.

Table 8

Daily Mean Caloric Consumption of Biscuit Cereal Ration
(Experimental Study V)

Group	Confinement Day				4-Day Mean*
	2	5	8	11	
Men	570.4	436.6	547.7	552.3	525.2
Women	507.0	437.3	538.7	535.2	503.7
Children (7-15 yrs.)	499.0	398.4	502.5	570.4	490.0
Total Group	527.4	426.5	530.8	550.2	507.1

*Due to defections, these means are based on varying Ns.

Table 9

Daily Mean Calcric Consumption of Wafer Cereal Ration
(Experimental Study V)

Group	Confinement Day				4-Day Mean*
	4	7	10	13	
Men	561.3	413.6	569.8	544.5	517.9
Women	558.4	363.4	462.8	433.3	454.8
Children (7-15 yrs.)	607.8	278.5	823.0**	901.1**	643.4**
Total Group	572.7	357.9	605.0	596.3	528.1

*Due to defections, these means are based on varying Ns.

**Unusually high caloric intake affected by excessively high daily rations for two younger males.

Table 10

Daily Mean Caloric Consumption of Cracker Cereal Ration
(Experimental Study V)

Group	Confinement Day				4-Day Mean*
	3	6	9	12	
Men	601.8	640.6	486.7	574.0	581.4
Women	489.2	528.5	529.0	485.3	508.1
Children (7-15 yrs.)	586.5	524.1	549.1	633.3	571.0
Total Group	554.4	566.1	522.2	553.9	549.8

*Due to defections, these means are based on varying Ns.

Table 11

Daily Mean Caloric Consumption of Carbohydrate Supplement for Men, Women, and Children (Experimental Study V)

Confinement Day	Men	Women	Children*	Total Group
2	298.6	293.9	290.0	294.5
3	176.0	215.7	213.0	201.4
4	292.0	301.0	308.1	299.8
5	252.0	301.0	308.1	286.2
6	273.0	308.1	308.1	296.3
7	308.0	277.3	308.1	297.7
8	267.4	286.8	308.1	287.3
9	267.4	287.0	308.1	287.5
10	199.7	292.5	304.7	257.6
11	243.7	258.1	308.1	267.2
12	230.2	247.5	308.1	258.5
13	230.2	281.8	308.1	272.5
12-Day Mean	255.6	277.4	298.0	275.9

*7-15 years of age.

c. Food Preferences

The order of relative preference for the cereal rations, from high to low, was the Nabisco biscuit, with the bulgur wafer and the Nebraska cracker being equally preferred. Detailed evaluation data on the cereal rations and the carbohydrate supplement are presented in Tables 12-16, which present conflicting data on higher preference ratings for the wafer and the cracker.

d. Commode Chemical Tests

During the study, four commodes were used (see Table 17). The first commode test (Weladyne as prescribed) was terminated when the commode was about three-fourths full, due to bag liner leakage, presumably because of broken glass discarded into the fiberdrum. The shelterees had no odor complaint as of that time; however, since in all previous studies Weladyne had induced an odor complaint by the time a commode was filled, and since it was desirable to evaluate other commode chemical tests in the present study, it was decided not to conduct a second Weladyne test, but rather go on to commode test number two. This test, consisting of the use of dry phenol and water (see Table 3), was so successful that it was continued throughout the study.

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8
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e. Cognitive Vigilance Task

Analyses of signal detection test data, in terms of reaction time and errors, indicated no deterioration in speed or accuracy of performance.

2. Defections

Eight subjects left the shelter before study completion. Of this number, three exited upon recommendation of the shelter nurse: a sixty-year-old woman felt nauseated and thought she might have a heart attack; a sixty-four-year-old man developed a severe cold and high fever; another woman, thirty-eight years old, developed an abscessed tooth halfway through the confinement period.

Table 12

Frequency of Shelteree Selections
of Best- and Least-Liked Cereal Rations*
(Experimental Study V)

Day	Best-Liked**			Least-Liked		
	Biscuit	Cracker	Wafer	Biscuit	Cracker	Wafer
4	19	0	7	1	13	10
7	21	0	4	1	9	13
10	18	0	7	3	10	9
13	16	1	5	2	12	7

*Nabisco wheat-flour biscuit; Nebraska wheat-corn-flour cracker; Bulgur wheat wafer.

**Not all shelterees stated their best-liked and least-liked preferences; consequently, there is a discrepancy in totals.

Table 13

Frequency of Shelteree Ratings of Cereal Rations*
(Experimental Study V)

	Poor	Satisfactory	Good
Day 4			
Biscuit	2	3	21
Cracker	6	9	11
Wafer	7	10	9
Day 7			
Biscuit	2	6	16
Cracker	5	11	8
Wafer	7	11	6
Day 10			
Biscuit	2	6	15
Cracker	5	10	8
Wafer	6	6	11
Day 13			
Biscuit	1	2	19
Cracker	2	10	10
Wafer	3	9	9

*Nabisco wheat-flour biscuit; Nebraska wheat-corn-flour cracker; Bulgur wheat wafer.

Table 14

Frequency of Shelteree Comments on the Carbohydrate Supplement (Experimental Study V)

Day	Number of Comments		
	Positive*	Negative**	Mouth Soreness
4	22	4	0
7	19	5	0
10	14	11	7
13	14	10	6

*Positive comments included: Good flavor, satisfies hunger, prevents dry mouth, reduces desire for cigarette, not enough quantity.

**Negative comments included: Too sweet, too hard, too much quantity, causes thirst, makes mouth sore, tired of it.

Table 15

Post-Shelter Evaluations of Cereal Rations*
(Experimental Study V)

Evaluations	Frequency		
	Biscuit	Cracker	Wafer
Too hard	1	11	2
Too crumbly	-	1	12
Not enough flavor	-	14	4
Made mouth sore	-	-	3
Didn't satisfy appetite	2	4	3
Hard to swallow	-	4	13
Caused thirst	1	6	8
Too dry	1	6	10
Too sweet	1	2	1
No complaint	12	3	4

*Nabisco wheat-flour biscuit; Nebraska wheat-corn-flour cracker; Bulgur wheat wafer.

Table 16

Post-Shelter Evaluation of Carbohydrate Ration
(Experimental Study V)

Evaluations	Frequency
Mouth sore	8
Too hard	4
Too sweet	4
Induces thirst	4
Not enough quantity	2
Not sweet enough	1
No complaint	8

Table 17

Chemical Commode Tests and Evaluation
(Experimental Study V)

Commode Number	Test Employed	Gross Weight When Sealed Off	Evaluation
One (S.K. III)	Weladyne as prescribed (Test No. 1, Table 3)	86 lbs.	Plastic bag assembly ruptured. Fiberboard drum weakened from leak before drum was filled. No comments on odor. Removed from shelter on 10 Feb. at 1030.
Two (Water drum)	Dry phenol and water (Test No. 2, Table 3)	110.5 lbs.	No comments on odor. Sealed off on 14 Feb. at 1130.
Three (Water drum)	Test No. 2 repeated	128 lbs.	Sealed off at 0930, 18 Feb., when 9/10 full. No odors until full stage reached, and not extremely bad then.
Four (Water drum)	Test No. 2 repeated	70 lbs.	Sealed off at 0830, 21 Feb. No odors noticeable.

Table 18

Defections
(Experimental Study V)

Time	Day	Date	Shelteree No.-Sex-Age			Reason
1100	Sun.	9 Feb.	1	F	7	Didn't feel too well; felt crowded; had trouble sleeping; disliked the food and water; missed her mother.
1100	Sun.	9 Feb.	27	F	60	Body ache; nauseated; leg pains; worried about her health; thought that she might have a heart attack; afraid she had a virus.
1100	Mon.	10 Feb.	12	M	20	Backache; felt crowded; had trouble sleeping on hard floor.
1100	Mon.	10 Feb.	3	F	9	Objected to crowded sleeping conditions (was kicked by other shelterees); vomited; disliked both food and water; toilet too high.
1120	Sat.	15 Feb.	26	M	56	Felt crowded; constant thirst; stomach-ache; for several days prior to exit felt constipated.
1120	Sat.	15 Feb.	28	M	64	Exited on advice of nurse and outside doctor; experienced severe cold and high temperature for 3 days.
1215	Sun.	16 Feb.	37	F	38	Exited due to medical reasons - abscessed tooth.
1100	Tues.	18 Feb.	5	F	12	Slight case of homesickness; planned to stay only one week.

The three children who defected seemed to be bothered by homesickness. The other two defections were adult males who experienced difficulty in adjusting to shelter living.

The time of departure and reasons for leaving the shelter will be found in Table 18.

3. In-Shelter Medical History

Medical Kit A was used in Experimental Study V. The items most frequently used were aspirin, kaolin and pectin mixture, salt and alcohol.

Medical complaints and treatment were recorded on a standard form by the shelter nurse. Headache was the most predominant complaint. Colds and/or sore throat came next. These two last categories comprised more than half of the medical problems in the shelter. A summary of the medical complaint record is presented in Table 19.

4. Shelter Events

Following is a day by day summary of the shelter confinement period:

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Saturday 8 February

After a morning of testing and a light snack of soup and sandwiches, milk and coffee, the shelterees entered the shelter at 1335. The designated but untrained manager for the group assumed command without hesitancy or interference, saw to it that the chemical commode was made operable, cautioned the shelterees concerning use of the facility, and solicited help for arranging shelter supplies along one wall of the shelter living area. Confinement began with an effective temperature (E. T.) of 69°.

At 1500 the first water was dispensed via the siphon from a drum sitting directly on the floor. At 1800 one-half day's racion of Nabisco wheat-flour biscuit and one cup of water were dispensed to each shelteree. The Civil Defense Information Test was taken by the Ss at 2000 with some collaboration on answers. One-half day's carbohydrate ration was distributed

Table 19

Summary of Primary Items on Medical Complaint Record
(Experimental Study V)

	Nature					
Day	Headache	Cold or Sore Throat	Stomach-ache	Nervousness	Other*	Total
1	2				2	4
2	8			1	2	11
3	4		1		3	8
4	1	1			1	3
5	6	1			2	9
6	4	3		1	2	10
7	1	1			3	5
8	1	4			1	6
9			1		2	3
10	1		1	2	0	4
11	1	1	2		1	5
12			1		0	1
13	2		1		0	3
Total	31	11	7	4	19	72

*Includes: nausea (3), homesickness (1), constipation (3), toothache (3), rash (2), cramps (1), general ache (4), sinus (2).

at 2030 (a plastic cup lid was used as a scoop), medical supplies were removed from the packing box, stored on a shelf, and the box was put into use as a trash container. During the first confinement day, the shelterees made playing cards from notebook paper, and #12 successfully used his pocket knife for fashioning playing cards from the corrugated fiberboard.

The first diaries were completed at 2125. Contents revealed general acceptance of shelter conditions. The manager reported finding the shelter handbook sufficient for initial needs, and stated that he planned to follow it loosely for the first day or so, since excitement and tension among the shelterees made it difficult to implement routine organization and activity beyond a minimal level. Shelterees #1 and #33 appeared homesick and cried during the evening; #47 verbalized a strength of religious conviction in light of the circumstances; #23 complained of soreness; #50 suggested that carbohydrate be dispensed before daily water ration was depleted, since it tended to create thirst; several shelterees (#13, #33, #8, #15, #5) complained that the water was not good. Some shelterees were surprised to find shelter conditions different and better than they anticipated, and most of them considered the food (Nabisco biscuit) acceptable. The only signs of unhappiness and concern over abiltiy to endure confinement were by #1, #33, #12, and #5.

The shelterees prepared for sleep and retired at 2300. The E.T. was 68.5°.

Sunday 9 February

At 0120 shelteree #19 awoke and complained loudly of being cold (E.T. 72°), and at 0200 complaints were heard of being too warm (E.T. 73.6°). Most of the Ss were restless during the night. Morning diaries completed at 0845 specified temperature as too warm for some and too cool for others, with the hard floor and crowded conditions mentioned as reasons for fitful sleeping. Morning diaries also reflected a general mild depression. The shelterees participated in isometric exercises at 0710. The SM reported difficulty in getting water to siphon properly, and the fragile plastic cups were already beginning to show signs of wear.

Food and water were distributed under supervision of the SM at 0930. Shelteree #28 made an air deflector from corrugated fiberboard, suspended by strings from the overhead air vent in the shelter. At 1000 a half-hour church service was held and received well by all Ss.

Shelterees #1 and #27 left the shelter at 1100 (see Defections), and the wall was adjusted. Food and water were distributed at 1210 with continued awkwardness and inefficiency in siphoning water. A rest period lasted from 1255 to 1400, with group exercise at 1445 and a second church service at 1750 which was led by shelteree #28, who read and discussed a selection from the Bible. The shelterees received the service attentively and participated in singing a hymn ("Holy, Holy, Holy"). Food and water were distributed a third time at 1815, and at 1845 the SM gave suggestions for better "shelterkeeping." The group sang for a while, and at 1915 carbohydrate was distributed. A jovial atmosphere prevailed with laughter, talking, and teasing. Shelteree #9 gave explanation of how to play "Charades," and the younger children participated in the game.

Evening diaries were completed at 2105 with a sparseness of writing. Most of the shelterees appeared accepting of their circumstances, and complaints were general and diffuse. Some of the children were reported as not eating as they should, #13 had been ill during the day, time seemed to drag for several, and a number of Ss reported missing familiar foods, friends, pets, and family.

Shelter clean-up, with the use of a corrugated fiberboard strip as a broom, was conducted at 2130. Lights were turned out at 2300, followed by a period of coughing and talking; quietness prevailed by 2400.

During the day, some shelterees used corrugated fiberboard as a covering while sleeping, more boxes were put into use as trash containers, a checkerboard game was improvised from corrugated fiberboard, and an ash tray was made from a ration can lid.

Monday 10 February

After a period of wakefulness around 0100, the shelterees were quiet until 0720, at which time a burst of spontaneous talking, laughing and joking occurred. Lights were turned on at 0730, and the Ss lined up at the latrine door at 0740.

Corrugated fiberboard mats were stacked for the day, the SM invited comments on sleeping, and the first meal was distributed at 0800. Shelterees #3 and #4 received attention from nurse (see Medical Records). During the morning, the Sanitation Kit III fiberboard commode was noted by Ss to be wet at the bottom and was collapsing due to a leak in the plastic liner. The leaking commode was removed from the shelter by the CDR staff at 1030, and the second toilet of the study was put into use. It is believed that broken glass discarded into the drum caused a tear in the bag liner.

Morning diaries were completed at 0900. Written comments focused generally on the better sleep experienced during the second night, dissatisfaction with the Nebraska wheat-corn-flour cracker (too dry and tasteless), and the situation created by the leaking toilet. Some shelterees (#12, #3, #4) appeared homesick and had thoughts of leaving the shelter. The men were not finding one quart of water sufficient for assuaging thirst; the women did not comment on this as a problem.

School for the children was held at 0930. Shelteree #15 and other older female shelterees assisted. The SM reported at 1100 that #12 had requested to leave, #3 was ill, and that the water level in the first drum was too low for working the short siphon tube. Number 12 and #3 left the shelter at 1105. At 1108 lunch was distributed (cracker, carbohydrate, and water). Following the meal, #21 read a story from a school text, and at 1210 the SM announced another mealtime. After this meal, the SM announced that various Ss would give survival lectures, using outlines provided in the management handbook and reference material stocked in the shelter for that purpose. The SM also encouraged the group not to become anxious over the lack of bowel movements, giving an explanation of why this could be expected. A rest period began at 1234 and continued until 1400. From 1410 to 1430, the SM spoke on Psychological First Aid. An exercise period lasted from 1440 to 1500. Food and water were distributed at 1755, and from 1821 to 1923 the shelterees sang with varying degrees of participation. A failing attempt to play "Bunny Hop" culminated in more reading to the group during the period 1925 to 2015. Water was distributed at 2020, this time being dipped from the drum rather than siphoned. For a brief while, #17 led in a Pass-the-Handkerchief game, and at 2055 the SM called for evening diary writing time, following which the handkerchief game continued. A game, "To See Something," and a spelling contest were introduced. Ss began to clean up and ready for sleep at 2205; #28 led the

group in prayer, and lights were out at 2245.

Evening diaries disclosed an adaptation to the Nebraska wheat-corn-flour cracker, especially with regard to its suitability in curbing hunger, and thirst complaint by male Ss. During the day, a donkey was drawn on a section of corrugated fiberboard for playing Pin-the-Tail-on-the-Donkey, and supply boxes were used to catch water spilled in siphoning and as a receptacle for vomit.

Tuesday 11 February

At 0600 some of the group awoke but quieted again until lights were turned on at 0730. Morning grooming was followed by the first meal at 0820, with the SM siphoning water from a new drum. The children began to study at 0900, were interrupted to complete diary forms, and resumed study while adults talked quietly and the SM prepared a lecture. Carbohydrate was distributed at 1115, a variation of "musical chairs" was played, and food and water were distributed at 1200.

Morning diaries disclosed a general lack of comment about sleeping conditions, but oriented more on shelteree thoughts about the food (bulgur wafer). The shelterees were diffuse in their acceptance of the food, some liking it and others disliking it. Number 4 was a concern to a number of Ss because he was not eating. The shelterees appeared to be beginning to miss common things such as the outside world, favorite TV shows, etc. A need for more water was evidenced, and the SM wrote of his intentions to increase the supply to 1½ quarts/person/day (six cups). Medical complaints such as mouth ulcers from the carbohydrate food supplement, sore throats and colds began to be evident.

The afternoon was begun with a rest period which lasted until 1400, at which time the SM announced time for exercise -- first the women and then the men participating. At 1420 water was distributed. The SM then lectured on nuclear bombs until 1520, followed by free time until 1805, the evening meal time. Some Ss played hand games during free time; others talked or rested or studied. Food evaluation forms were completed at 1815. Number 9 led the group in singing from 1840 to 1940, and evening diaries were completed at 2055. Water was dispensed at 2120. Number 34 and #8 later played the "Star-Spangled Banner" on combs covered with paper. Clean up and readying for sleep were completed around 2145. Number 34 told

a bedtime story (an innovation of "The Three Bears"), and lights were turned out at 2245. The day ended with a relaxed tone of group cohesiveness and enjoyment.

Evening diary contents were general and diffuse. The main concern was thirst. Other comments focused on the profit incurred by the confinement experience, and morale appeared high.

Wednesday 12 February

At 0105 #34 fell off the water drums, where he had chosen to sleep, with quietness then prevailing until 0710 when general stirring began. By 0745 a number of Ss were exercising informally, females engaged in morning grooming, and at 0830 Ss lined up for the first meal of the day (a return to the Nabisco wheat-flour biscuit). Number 25 siphoned the water with difficulty. Morning diaries were written at 0900, and the students began their studies shortly thereafter. During the study period, which lasted until 1200, the adults talked quietly. Water and carbohydrate were distributed at 1010.

Morning diaries suggested a general tone of amiability with continued comment by the men on the need for more than five cups of water per day. Shelteree #4 continued in his refusal to eat, and #5 expressed homesickness and unhappiness. It also appeared that several Ss were bothered by skin irritations resembling insect bites. Several female Ss expressed amazement with how unexpectedly well they and others were enduring confinement.

Food and water distribution at noon was followed by a rest period or general free time lasting until 1400. At 1400 an exercise period was announced, with a training lecture held at 1445. A snack was served at 1520, breaking an afternoon period of free time for study or quiet conversation. Another exercise period occurred at 1700. Suppertime was at 1800, following which the Ss sang, talked, and played "Hop-Scotch" until 2100, at which time evening diaries were written. A bedtime snack was served at 2120, while shelteree #25 read a story to the group about Abraham Lincoln. At 2210 shelter clean-up and preparations for retiring were underway, and Vespers (prayer and Bible reading) were held at 2245, the conclusion of the day.

Evening diaries generally lacked the usual comments on

the need for more water, due to the ration being increased by one cup/person. The day's lecture was well received and provoked discussion. One shelteree manifested concern that space was not better utilized by storing supplies in the toilet area. The SM commented on the usefulness of the management manual. For the most part, diary contents revealed increasing acceptance of and adjustment to shelter austerity.

Shelterees were observed using alcohol and 4 x 4 gauze pads from Medical Kit A for cleaning their hands, and the cotton swabs were used by some to clean their fingernails. The problem of too low a water level for effective siphoning was solved by putting a new drum into operation, dispensing a portion of the water, and then pouring the remainder of a former drum into the new one. Coins were used for pick-ups in "Hop-Scotch."

Thursday 13 February

During the early morning hours prior to arising, several Ss were observed to be restless. Once a person moved from his sleeping position to visit the toilet, to stretch, etc., his place often was absorbed by sleeping Ss. The group arose at 0735 and engaged in morning grooming while informally discussing nuclear war and life in shelters; breakfast was distributed at 0830. Water was dispensed by dipping it from the drum with a plastic cup. Morning diaries were completed at 0900, and a school session was begun at 0910. Water was dispensed again at 1005.

In his morning diary, the SM commented on his displeasure with some shelterees. He stated that male Ss were generally complaining more than female Ss, and he expressed concern over the rapid accumulation of trash. Other diary records consisted of favorable reactions, especially from female Ss. Number 24 intimated an intention to leave the shelter soon, and #26 evidenced some concern over his constipation since entering the shelter.

At 1200 food and water were dispensed, followed by a rest period lasting until 1400. The SM led a group exercise session to break the rest period. Shelteree #50 presented a lecture on radiation detection methods at 1430. A snack was served at 1530, followed by free time (studying, conversation, etc.). The Ss exercised at 1700 and had their evening meal at 1745. Number 4 was still not eating his rations, but did consume water and carbohydrate. At 1900 the SM initiated a game involving passing a

bobby pin from one S to another. The group had a song session at 2000 under the leadership of the SM and #9. Number 34, #9, and #5 presented a dance routine. Water was dispensed at 2130, with #25 continuing to dip it from the drum. Evening diaries were completed at 2050, clean-up was conducted at 2145, and the Ss settled for sleep as #21 read from Kon Tiki. Lights were turned out at 2300. In his evening diary, the SM indicated that he had decided to allow the Ss to be on their own during the early evening hours. He was apparently bothered by the incessant, unavoidable contact with the Ss in such a limited environmental context and chose this as a time to psychologically retreat from his leadership role. Number 13 reported solving difficulty with the water taste by puting a few drops of mouthwash into her cup. Problems with dispensing the water appear to be of concern to some — the shortness of the siphon tube and the problem of spillage when doubling back the end of the tube. Number 33 reported being homesick; #4 confided in #25 that he would begin eating because he was hungry; #5 wrote that she wanted to leave; #32 appeared tearful at slight provocations. Others seemed to be continuing a generally positive adjustment.

Friday 14 February

By 0745 the Ss were up and milling around. Breakfast was dispensed at 0825, with #25 continuing to dip rather than siphon water. Diaries were written at 0900. School was in session until 1200, while most female adult Ss appeared to be trying to sleep. A tone of lethargy generally characterized the group. Water and carbohydrate were dispensed at 1010, and it appeared that dipping water was the accepted procedure. At 1100 chemicals for the third commode were passed into the shelter. Lunch was served at 1200, and a rest period marked by unusual quietness lasted from 1230 to 1400. Group exercise was conducted at 1405. Number 22 presented a lecture on warning systems at 1425. Free time marked the 1600 to 1800 time block, with children studying, and adults talking or resting. Food and water were distributed at 1800. The evening was marked by informal activities such as telling funny stories, playing Pin-the-Tail-on-the-Donkey, or resting. Completion of evening diaries occurred at 2100, and water and carbohydrate were dispensed at 2120. The Ss then began cleaning the shelter in preparation for sleep. They sang for awhile, and at 2210 #21 read aloud a story entitled "Ichabod." Before lights were turned out at 2245, the Ss prayed the Lord's Prayer. Ss continued to talk for a while thereafter.

Diaries for the day announced the beginning of the third drum of water and the third toilet. There was evidence of a variety of complaints: the SM complained that the nights were too warm; #24 and #26 were discussing leaving; several complained of too much inactivity; the women were running short of sanitary napkins, and toilet tissue was getting low; #44 missed cigarettes; #34 complained of rubbish in his water; #28 was running a fever; #15 reported anger with the children because they had not completed their school assignments for the day; #5 expressed hatred for confinement and hostility toward the experimental staff; and #19 was bothered about no recent bowel movement. The general tone of the day was one of sluggishness, lethargy and generally low spirits.

Saturday 15 February

With a minimum of activity and restlessness during the night, the Ss were quiet and did not begin the day until 0815. The shelterees prepared themselves and the shelter for the day and ate breakfast at 0835. Water was again distributed at 1010. Diary forms were completed at 0905, in which concern was expressed for #28 and his rising temperature; #37 complained of a toothache and mouth soreness; #26 wanted to leave because of constipation; and #24 intimated leaving. At 1020 the SM phoned the experimental staff to say that #26 wanted to leave and to seek advice on the condition of #28 who did not want to leave. Quiet conversation and relative inactivity followed the call, and at 1120 #26 (by choice) and #28 (by experimental staff decision) left the shelter (see Defections). Food and water were distributed for lunch at 1200.

A rest period lasted from 1250-1400, followed at 1400 with group exercises led by the SM. At 1430 the nurse (#25) presented a lecture on First Aid and transportation of the injured. Water was distributed at 1445 and free time was available from 1500-1700, during which the Ss sang and talked informally. Food and water were distributed at 1745, and #4 for the first time received food in addition to carbohydrate and water. At 1840 the Ss began a lively game of Bingo made from corrugated fiberboard. A song fest followed at 2035, and food and water were dispensed at 2100. Diaries were written at 2105, and generally lively activity prevailed until 2215, at which time Ss began preparing for the night. Number 21 read aloud to the group, and after group recitation of the Lord's Prayer at 2305, lights were turned out.

Evening diaries included such indications as Ss' appreciation of the variety in the survival rations, a diminishing of tolerance of shelter life, indications that most of the Ss were just living for the day of exit, and that some continued to be sore from sleeping on the floor. Time appeared to be passing faster. All Ss seemed enthusiastic over the Bingo game. The nurse noted mild sore throats in the group.

Sunday 16 February

Shelterees slept until 0900, then rose, cleaned the shelter area, breakfasted at 0920, completed their morning diaries around 1000, and participated in a church service led by #47 from 1100 to 1130. Following services, the Ss discussed experiences concerning death in sober though not morbid fashion. Food and water were dispensed at 1200.

Morning diaries disclosed that #37 had an abscessed tooth and was in pain, though she did not want to leave the shelter. On the basis of the shelter nurse's recommendation, #37 was removed from the shelter at 1215 (the seventh defection). Diaries further indicated mixed reactions to temperature, and a concern among male smokers with the near exhaustion of smoking materials.

At 1240 water was poured into an empty ration can and Ss were told they might use this for a "sponge bath." Not all Ss chose to bathe, but most of them changed their underclothing and socks at this point in confinement. The SM discussed fallout shelter living conditions with the Ss while some took turns "bathing." By 1320 the Ss were quietly resting, and at 1435 #13 presented a lecture on caring for the sick. Group exercise was conducted at 1530, and this was followed by water distribution and singing. Ss rested at 1600. Shelteree #32 broke out in a rash during the afternoon. There were some complaints of sore mouth from the carbohydrate.

At 1755 food and water were dispensed. The Ss spent the evening playing Bingo, wrote evening diaries at 2130, and listened to reading by #21. Lights were turned off at 2245. Evening diaries indicated that the day had been a lazy one, that the Ss found the church service quite meaningful, and that hives (#32) and sore mouths were chief medical complaints. Ss began to mention quite frequently the need for blankets as a useful shelter item.

Monday 17 February

The only disturbance during the night was an unusual amount of coughing by unidentified Ss, in addition to #22. Lights were turned on at 0745, Ss cleaned the area of corrugated fiberboard mats, and breakfast was served at 0815. Morning diaries were written at 0915, in which the Ss indicated that many had not slept well, that smokers were concerned over having exhausted their tobacco supply, and that the shelter was quite dirty with loose hair and overflowing trashboxes. School was conducted from 0930 to 1100, interrupted at 1010 by a water and carbohydrate break. Lunch was dispensed at 1200, following a session of active games instigated at 1100.

From 1255 to 1400 the Ss rested, and at 1415 participated in group exercises. A training lecture was presented by #19 at 1430, followed by a snack served at 1510. More school and free time lasted from 1600 to 1800, at which time the Ss had supper. At 1835 a singing session ensued, and at 1945 several shelterees presented a play, "Tom Sawyer." Bingo followed the play. Food evaluations and evening diaries were completed at 2045. Shelter clean-up was conducted at 2130, followed by the singing of a shelter version of "She'll Be Coming 'Round the Mountain." Lights were out at 2250.

Evening diary comments revealed that many were tired, and anticipating release. Number 24 continued complaints of stomach problems, and #5 stated her desire to leave the shelter on Tuesday. The passage of time appeared to be slower.

Tuesday 18 February

Ss waked and began the day at 0745. The night hours were atypically quiet, and Ss commented in morning diaries (0850) that they slept well. Breakfast was distributed at 0825, with water being dispensed a second time at 1015. The day followed an established routine: school for students and conversation or sleep among adults from 0900 to 1200, at which time lunch was served; a rest period from 1230 to 1400; exercise at 1400; training lecture at 1435; snack at 1515; dinner at 1800; games and singing from 1840 to 2200; clean-up and preparation for bed at 2200; shelteree #21 reading aloud to the group; and lights out at 2300.

At 1100, shelteree #5 left the shelter (the eighth and final interim departure).

Diary contents for the day revealed growing anticipation of exit. Commode #3 was sealed off and #4 put into operation. Ss criticized the strength adequacy of the plastic cups, and became more verbally concerned about food. Desire for tobacco was increasing among smokers. The SM stated his assumption of blame for the lethargy and inactivity which typified the group throughout the study. The last roll of toilet tissue was dropped inadvertently into water; Ss dried it by hanging the roll under the air vent.

Wednesday 19 February

The night was quiet and uneventful, save a sleeping child crying out at 0545. The Ss reported an increase in bothersome dreams as confinement progressed; however, they also evidenced better adjustment to sleeping conditions by reporting better sleeping and being observed less restless during night hours. The day began when shelter lights were turned on at 0810. The Ss groomed themselves and ate breakfast at 0845. (A new water drum was opened.) Morning diaries were completed at 0900, and school for the children ensued from 0920 to 1110 while the adults read or talked. Lunch was served at 1200.

Morning diaries were lacking specific content, although Ss did indicate that they slept well the previous night and complained about inactivity and boredom. The general uncreative, uninitiating attitude of the SM beyond mechanically following a set routine given in the handbook had apparently begun to create group dissipation. Body odors, particularly from feet, became a complaint.

A rest period from 1250 to 1400 was followed by exercise (1400) and a training session (1445), led by the SM, on radioactivity and decontamination. Water was dispensed at 1535. The Ss participated in games and exercise at 1700, and the evening meal was served at 1750. During the evening the Ss engaged in much singing, consisting of religious songs for the most part. Evening diaries were completed at 2055; water was distributed at 2115; shelter clean-up was conducted at 2145; shelteree #21 read to the group after all were settled for the night; and lights were out by 2250.

The evening diaries were again sparse in meaningful content. There was indication of increasing hunger, and the SM wrote of his growing awareness of his lack of interest in the

group, typified by his increasing irritability and lack of concern for initiating group activity. During the day female Ss were observed using cotton from Medical Kit A to clean their faces, and one female shelteree made a hip pad from cotton and a handkerchief.

Thursday 20 February

Shelterees slept until 0840. Morning diaries were completed, and breakfast was dispensed at 0930. School for children was conducted at 0945. At 1130 the SM was informed of time of exit for the next day, with a cheer from Ss in response to the news. Lunch was served at 1155. A rest period from 1230 to 1415 was ended with a period of exercise and a training session at 1430. The afternoon was one of random, informal activity marked by more talkativeness and animation than preceding afternoons. The Post-Shelter Questionnaire was completed during this time. The evening meal was held at 1750 following which the Ss sang and played Bingo. Water was dispensed again at 2115. Evening diaries were completed at 2100, followed by clean-up and retiring for bed with lights out at 2210.

Diary contents for the day revealed random comments--some Ss were too warm and some were too cool the previous night; some slept well and some slept poorly. All Ss evidenced pleasure in themselves personally and as a group for having endured confinement the full period, and they expressed appreciation for having been allowed to participate in the study. 11

Friday 21 February

The shelterees were awake and active at an earlier time (0620) than on any other morning during the study. Departure from the shelter began at 0830. The Ss were examined by staff physicians, took post-confinement tests, and were observed to be in exceptionally good spirits throughout the day. Post-shelter testing was completed by early afternoon.

5. Shelteree Reactions

Attitudes and reactions of shelterees were evaluated several ways: (a) a Shelter Entrance Questionnaire completed prior to entrance, (b) an unstructured shelter diary sheet filled out twice daily, (c) food

and carbohydrate supplement evaluation forms completed at three-day intervals during confinement, and (d) a Post-Shelter Questionnaire administered the day prior to shelter exit.

a. Shelter Entrance Questionnaire

As in previous experimental studies, participants in Experimental Study V completed a Shelter Entrance Questionnaire designed to elicit their preparedness for emergency survival, the source and content of their knowledge about the research, their prior acquaintance with other shelterees in the study, and their anticipations of stress to be incurred by the confinement experience.

One factor was anticipated to be stressful by at least half the group: lack of bathing facilities.

b. Shelter Diaries

A daily synthesis of shelter diary comments has been discussed under Shelter Events.

c. Food Evaluation Ratings

Shelteree evaluation of the cereal foods and carbohydrate supplement has been presented in Tables 12-16.

d. Post-Shelter Questionnaire

The afternoon of the day prior to shelter exit, the twenty-two remaining shelterees completed a Post-Shelter Questionnaire designed to determine and evaluate various discomforts incurred by confinement, to assay general adaption to and tolerance for shelter living, to elicit sociometric choices along several dimensions, and to ascertain shelteree reactions to shelter supplies and procedures.

Discomfort factors mentioned by at least one-third of the shelterees are listed in Table 20, in terms of number of shelterees complaining, and also in terms of relative mean ranking. Chief complaints

Table 20

Selection and Ranking of Major Discomfort Items
(by One-third or More Shelterees Completing Experimental Study V)

Item	Rank on Basis of N	N	Item	Rank on Basis of Mean Evaluation	Mean	N
Lack of bathing facilities	1	15	Lack of bathing facilities	1	1.7	15
Boredom	2	11	Other people in the shelter	2	2.3	5
Sleep conditions	3	10	Sleep conditions	3	2.4	10
Uncomfortable temperature	4	8	Lack of exercise	4	2.5	6

were lack of bathing facilities, boredom, sleep conditions, and uncomfortable temperature.

The shelteree's estimated tolerance for continued confinement was 10.0 days beyond the twelve days already spent in the shelter. The median male estimate was 11.0 additional days, and the female median estimate was 7.0 additional days.

e. Sociometric Analysis

The shelterees selected as the most desirable future shelter companions were #22 (46-year-old male), #6 (10-year-old male), #14 (the SM), and #9 (16-year-old female). The individuals rejected as undesirable future shelter companions were #24 (51-year-old male) and #44 (44-year-old male). When asked to choose two persons that might make a good future SM, the group selected shelteree #50 (22-year-old male).

In terms of social interaction, observers ranked the following shelterees as most dominant in group leadership and participation: 14, 25, 15, 50, and 9. Shelterees ranked as socially withdrawn were: 30, 24, 4, 44, and 22.

f. Shelter Manager Report

The shelter manager submitted a report shortly after completion of the study. With the exception of minor editing, it is presented below in its entirety:

"My feelings about the fallout shelter were the same as most everyone else concerned with the study. I was full of apprehension and concerned with my own ability to cope with the situation.

"Needless to say I was shocked when I first saw the shelter. Even though I had known of the space limitations I found it hard to imagine the actual limits of the space until I actually saw it. My first reaction was that it was almost too crowded. After a couple of days I felt that the

space was adequate and row feel that under some circumstances the space available to each person could possibly be reduced. The only problem would come in the sleeping arrangements but this could be worked out within a few days of confinement.

"The individual shelterees involved in the study were, I felt a good cross section of the local population. I do feel that a future study should possibly include more individuals with a higher educational leve primarily to study their reactions with the lesser educated. This could possibly be done in Athens since the University of Georgia is located in Athens. It would be interesting to study the difficulties that could possibly arise in the leadership area during such a study. I also feel that in order to lend a more realistic atmosphere to a future study that a couple of Negroes should be included.

"The shelter manager's handbook was adequate and the average person could use the handbook and set up a routine for shelter living with very little difficulty.

The equipment in the shelter was adequate and the following recommendations are made with the understanding that the expense of equipping a shelter must be kept at a minimum. A small broom or "foxtail" should be provided in each shelter for purposes of cleaning. At the present time nothing in the shelter lends itself very well to the problem of sweeping and cleaning the shelter. This was an area in which the group had some difficulty due to the amount of loose hair that was in the shelter almost continually. It is also recommended that some type of small, inexpensive hooks be attached to the walls of the shelter for the purpose of hanging bags, clothing, etc. This would keep these items off the floor and out of the way of the shelterees.

"The chemical toilet used in the study was completely satisfactory. I did not notice any odors except on one occasion when we allowed the toilet to get too close to the sanitary fill line. I did find that the toilet was a little too high. The water drums used for the toilet could possibly be reduced

in height and increased in circumference and still hold the same amount of water.

"The water provided during the study was also satisfactory. A very definite odor and taste was noticeable to everyone and for the first two or three days many of the shelterees, especially the women and girls, did not take their full ration of water. After this period of time very few comments were heard about the water, and a full ration was accepted. The amount of water allowed per day was sufficient after everyone's body became used to the reduced intake of liquids. I myself was extremely thirsty while we were issuing five cups of water per day. After the third day the ration was increased to six cups per day. A few days after the increased ration was put into effect I did not experience thirst. In the future studies it could be possible to start the water ration out at six or seven cups per day and at some time during the study reduce the ration to five cups.

"The siphon method of dispensing the water is completely unsatisfactory. We had difficulty in siphoning the water out of the drums with the tube provided. There is a possibility that the tube would work better if it were lengthened. The siphoning method is also wasteful when dispensing water since the tube cannot always be pinched off in time after a cup is filled. I feel that a "dipper" with a handle could be provided for dispensing the water. This may not be the most sanitary method available, but by providing a dipper with a handle and a plastic bag in which to stow the dipper when not in use would probably be as sanitary as the use of the rubber tube. The tube as it is presently used can be unsanitary due to the fact that the end that has been touched and handled could at any time be accidentally placed in the water.

"The plastic cups presently being used are also completely unsatisfactory. These cups are so easily broken that getting the shelterees to take care of them can be a major problem at the beginning of a study. Once the plastic cups are split or broken it is completely useless. I am of the opinion that a

cheaper paper cup could be devised and stored in the shelter. Indeed I am sure that such a cup is already available. A paper cup will very often hold water even after it has been stepped on, slept on, sat on, kicked, etc. The plastic cup will not take this type of abuse.

"The food rations provided during the study were satisfactory. Of the three types used, type "A" (biscuit) was definitely the better as far as I am concerned. Type "B" (cracker) was the inferior of the three types. Type "B" was much too dry and has no flavor, and the cans of type "B" used in this study all contained a great many packets of crackers that were burned. This did not help the acceptability of type "B" at all. This I feel was due to improper preparation on the part of the manufacturer and I think the crackers would be much better were they not burned. Type "C" (wafer) was certainly adequate and filling. With something added to give more flavor type "C" would probably be far superior to the other types of ration used. At no time during the study did I experience a feeling of hunger. I think this was generally true of most of the adults; however, several of the children, especially the boys were continually complaining of hunger.

"Strict control of the rations was difficult due to the fact that all of the shelterees had varying ideas as to the acceptability of the various types of rations. When a type that was not acceptable to one person was issued he would initiate a trade with a person who did not like the type that was to be issued the following day. This probably caused the meal summaries to be inaccurate. Also an adult would draw a full ration and then give all or part of his ration to one or more of the children.

"There was only one time during the study that body odors were bad. This was from one of the boys who was wearing sneakers. His feet were sweating so badly that the odors from his feet became almost unbearable until they were cleaned. No other body odors were noticed. I would recommend that in future studies no one be allowed to wear sneakers in the shelter.

"The area of activities for the shelterees was definitely a problem for me. By this I mean that I do not require organized activities and do not really care for them. I have always been able to occupy my mind without organized activities. I could not get the adults completely interested in organizing activities for the young shelterees. This would have been due to my attitudes toward this area of shelter life. As far as I could tell this did not concern too many of the shelterees, especially the men. Also the lack of organized games could have been due to the makeup of the shelterees. Most of them seemed to be able to do without games and other activities. In the event that other shelter managers feel as I do, the handbook should be expanded with more ideas and suggestions on the various types of games and activities. At the same time it is almost necessary to have among the shelterees at least one person who has an interest along these lines and can organize and conduct activities.

"The study was to me one of the most interesting and valuable experiences that I have ever had. I feel that I learned quite a lot about myself as well as the other people connected with the study."

6. Environmental Data

a. Temperature and Humidity

The initial ET was 69° at the time of entry, in anticipation of a rise due to shelter activity. However, at the request of the shelterees, the ET was raised to 72° within a few hours, and remained fairly stable over the first ten days.

b. Activity Level

Activity levels were fairly constant over the two-week confinement period.

B. Pre- and Post-Shelter Test Results

1. Medical Examination

Post-shelter medical examinations indicated no deleterious physical effects from shelter confinement. There was a mean weight loss of 9.5 pounds for those who completed the study. In terms of percentage of original body weight, the decrement was 6% for both males and females. 14

2. Psychological Testing

15

The median intelligence quotient of the 30 Ss who participated in ES V was 95, the range 76 to 132. There was no evidence to indicate any loss of mental acuity for children or adults as a result of shelter confinement.

The patterns of adjustment for the group, as reflected by the MMPI and the California Test of Personality, showed no significant changes from pre- to post-testing.

As one means of evaluating the effectiveness of the in-shelter training program, the Ss were given a Civil Defense Information Test on the day of entry and again on the day prior to exit. The same form was used for both pre- and post-testing. Nineteen of the 22 Ss who completed the test on both occasions showed moderate gains on the post-test. Apparently, most shelterees gained additional information about CD operations through the training program. However, since shelteree collaboration was observed while the test was administered in the shelter, the validity of the test data is questionable.

IV. Conclusions

The following conclusions were indicated by Experimental Study V:

A. General Conclusions

1. Healthy men, women, and children, aged 7-70, can subsist for 13 days under crowded conditions on water rations

of 1 qt./person/day, survival rations of 808 cal./person/day, and sleep on a concrete floor covered only with corrugated fiberboard, without suffering deleterious physiological or psychological effects.

2. Minimal OCD supplies as presently stocked in public fallout shelters appear to be sufficient for healthy men, women, and children for a 13-day survival period.

B. Specific Observations

1. Shelter Environment

a. Limited living space of 8 sq. ft/person and 1 cu. ft./person additional storage is tolerable.

b. In terms of survival, corrugated fiberboard is an adequate substitute for bunks as a sleeping surface.

c. The commode chemical, phenol, proved satisfactory.

d. The Nabisco biscuit was the most preferred cereal ration.

2. Shelteree Reactions

a. Eight defections occurred during the study.

b. Average (median) estimates of endurance of extended shelter stay for males and females were 11 and 7 days respectively.

c. The mean weight loss was 9.5 pounds, or 6% for both males and females.

d. Primary environmental complaints were: lack of bathing facilities, boredom, sleep conditions, and uncomfortable temperature.

e. Primary physiological complaints were: headaches and colds.

f. Cognitive vigilance, in terms of visual and auditory signal detection tasks, showed no deterioration during shelter confinement.

Appendix B

Experimental Study VI

Table of Contents

Abstract

On 31 July - 2 August, 1964, the Civil Defense Research Staff at the University of Georgia conducted a 300-person, 50-hour fallout shelter confinement test. Men, women, and children aged 3-66 years participated.

The results of this study (Experimental Study VI) are presented in this report.

List of Tables

List of Figures

I. Introduction

Experimental Study VI (ES VI), conducted 31 July - 2 August, 1964, was one of a series of experimental fallout shelter occupancy tests being conducted at the University of Georgia. The findings and implications of this test are presented in this report.

II. Experimental Design

A. Purpose

The purposes of ES VI were to evaluate (1) shelter staff management of a 300-person group for a 50-hour confinement period, (2) optimal size of manageable shelteree units within the total group, (3) in-shelter activity programs, (4) an in-shelter handbook, (5) use of shelterees ranging in age from 3-66 years, (6) Office of Civil Defense supplies for a 300-person shelter, and (7) various ventilation conditions and equipment.

The original mission was to evaluate 300-person shelter management as proposed in current Office of Civil Defense (OCD) policy. However, this mission was changed, at the request of OCD, to include a synthesis and application of the various findings of previous occupancy tests by OCD contractors and regional training centers (see References). Since ES VI was the first of its kind ever conducted in the United States, and since the possible test designs were multiple, it was decided to concentrate on certain variables for the 50-hour confinement period and to exclude others for investigation in future tests.

B. Shelter Staff Management

1. Shelter Staff Selection and Training

Prospective members of the shelter management staff were recruited from an area within one hundred miles of Athens, Georgia. As an aid to evaluation, rating scales and a follow-up questionnaire were implemented. Characteristics of the selected staff are presented in Table 1. Age ranged from 27-48 years, median age 36 years. All of the thirteen staff members had college degrees, and one had a master's degree in education. Occupations were as follow: two U. S. Naval officers, two public school teachers, four Civil Service personnel, two advanced college

Table 1

Shelter Management Staff Characteristics
(Experimental Study VI)

Staff Position	Age	Background	OCD Training
Shelter Manager	37	B.A., M.Ed. - Agent Publishing Co.	None
Asst. Shelter Manager	28	B.S. - U. S. Navy	None
Director of Operations	41	B.S. - Civil Defense Director	Radiol. Monit. for Inst., Elements of a Shelter System Capability, Radiol. Def. Mgnt., CD Planning and Operations and CD Mgnt.
Director of Information and Training	34	B.A. - Counselor and Teacher	CD Adult Class
Director of Supply and Maintenance	29	B.S. - U. S. Navy	None
Section Leader	31	B.A. - Civil Service, Mgnt. Analyst	SMI Course
Section Leader	29	B.A. - Grad. Student	SMI Course
Section Leader	36	Vet. Student	None
Section Leader	39	Law School - Deputy Chief, Security and Law Enforcement, Robins AFB	CD Planning and Testing, Robins AFB
Section Leader	48	B.A. - Civil Service	Disaster Control Plans, Robins AFB
Section Leader	33	B.S.A. - Civil Service	State Dept. of Ed. Survival Course
Observer	46	Rural CD Agent	SMI Course
Observer	38	B.A. - Teacher	None

students, one publishing company agent, and two Civil Defense workers. Five of the staff had received no prior Civil Defense training. The other seven had attended at least one or more courses, with one having taken five such courses.

The shelter staff was given two days' training on consecutive Saturdays. Content of these sessions is presented in Table 2.

2. Shelter Staff Organization

The 11-man management staff is outlined in Figure 1. Two additional staff members served as in-shelter observers. The six shelteree sections, A through F, were composed of 25, 25, 50, 50, 75, and 75 members, respectively, in an effort to evaluate optimal section size.

C. Shelteree Characteristics

The 300-person shelter group consisted of men, women, and children, aged 3-66 years. Seventy-five per cent of the group was composed of family units and 25 per cent of individuals. A comparison of the ES VI group with the U. S. 1960 census is given in Table 3.

The total group of 300 persons included the Shelter Management (SM) staff, four medics, seven Civil Defense Research (CDR) observers, five OCD observers, one observer from the U. S. Army Military Police School at Ft. Gordon, Ga., and three engineers from the General American Transportation Corporation, MRD Division, Niles, Illinois. The OCD observers represented the Washington office and the three training centers located at Battle Creek, Brooklyn, and Alameda, respectively.

The recruited shelterees submitted a medical history statement for evaluation prior to selection for the study. No physical exam was given, although shelterees were queried on the day of entry with regard to any infectious illness.

D. Pre-Shelter Processing

The University of Georgia Coliseum served as the processing area. Shelterees were processed from 2:00 P.M. - 4:00 P.M., Friday, 31 July. The 50-hour shelter confinement period lasted

Table 2

Shelter Management Staff Training
(Experimental Study VI)

June 20, 1964 (10:00 A.M. to 4:00 P.M.)		June 27, 1964 (10:00 A.M. to 4:00 P.M.)	
Introduction	10:00-10:30	Staff Assignments	10:00-10:30
CDR Film	10:30-11:15	Organization of Shelter Operations	10:30-11:30
Employment Processing	11:15-11:45	Pre-Shelter Processing	11:30-12:00
Lunch	12:00-1:00	Lunch	12:00-1:00
Shelter Tour	1:00-1:45	Test Battery	1:00-3:00
General Experimental Orientation:		Summary of ES VI	3:00-3:45
(1) Two-Week Shelter Studies	1:45-2:15	Question and Answer Session	3:45-4:00
(2) ES VI Experimental Variables	2:15-2:45		
(3) ES VI In-Shelter Program	2:45-3:15		
Question and Answer Session	3:15-3:45		

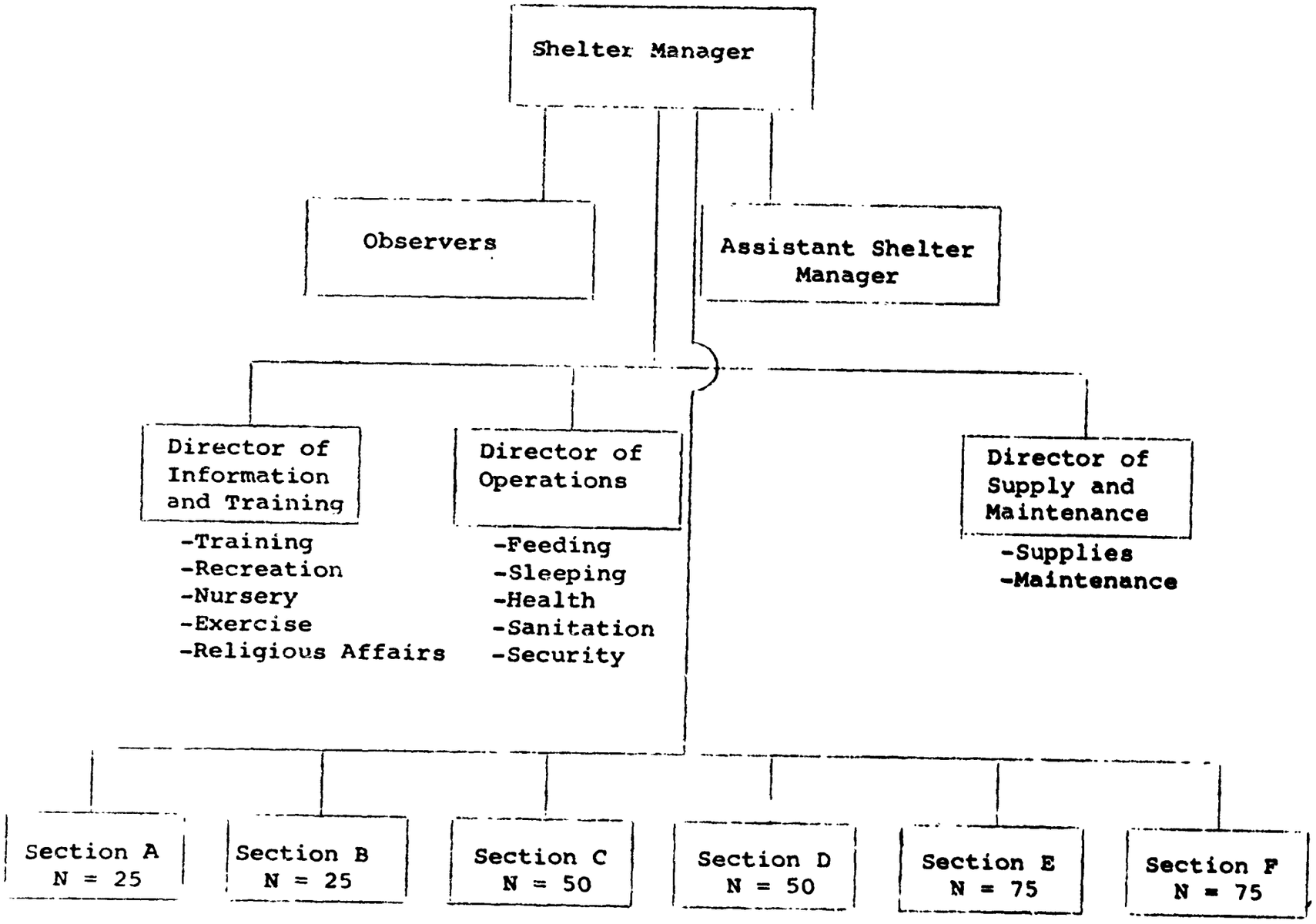

Figure 1. Shelter Staff Organization (ES VI).

Table 3

Shelteree Characteristics
(Experimental Study VI)

	U.S. Census (1960)	ES VI (1964)
Number of Shelterees		300
Age Range		3-66 years
Median Age	29.5 years	17 years (mean age 23)
Median Education	10.6 years	12.8 years
Sex	Male 49%, Female 51%	Male 50.7%, Female 49.3% (152 males, 148 females)
Race	White 88.6%, Non-White 11.4%	White 88.7%, Non-White 11.3% (266 Whites, 34 Non-Whites)

from 4:00 P. M. Friday until 6:00 P. M. Sunday

Processing included the following phases.

1. Roster Check

Upon entering the coliseum, each shelteree was checked against a previously prepared list, and each was assigned a section letter designating his placement in one of six sections. Family members were assigned to the same section. All but ten of the 300 recruited shelterees reported. These ten were replaced by standbys.

2. Shelter Bag Check

Shelter bags were collected, checked for contraband items and returned to their owners after entrance into the shelter. Such items as food adjuncts, radios, knives, and cameras were removed from the bags and retained for their owners until the conclusion of the study.

3. Medical Inquiry

A medical inquiry detected any current physical ailment which might have adversely affected the shelteree or others as a consequence of confinement, e.g., a cold, sore throat, or asthma. Individuals having such conditions were referred to one of two standby physicians, who determined whether or not the individual should be allowed in the shelter.

Twelve persons with prescribed medication were permitted into the shelter. Twenty-three other persons had minor ailments such as colds, headaches, sprains, etc., and were also allowed to participate in the study. No shelteree was rejected for medical reasons on the day of entry.

4. Photographs

Next a photograph was taken of each shelteree for purposes of later reference.

5. Testing

A sample of adults was given a pre-shelter questionnaire and a brief personality inventory (see Section III for results). During this phase, children (aged 3-14 years) were

taken to a movie room for film entertainment. 5

When adult testing was completed, the children rejoined the other members of their families.

6. Project Director's Address

The Project Director talked briefly to the group prior to shelter entrance, commending them on their patriotic participation and informing them of the national significance of the study. Afterwards, the shelterees were moved by sections to the shelter.

E. The 300-Person Shelter

The shelter selected for ES VI was one marked and stocked in accordance with procedures established by the National Shelter Program; it had a protection factor of over 100. The shelter was located on the University of Georgia campus, in the basement of the Georgia Center for Continuing Education.

The shelter configuration is portrayed in Figure 2. The dotted line delineates the actual shelter area which was divided into two rooms by a wall. The larger room contained approximately 2,500 sq. ft. of space, the smaller about 500 sq. ft. of space. One of the 50-person sections occupied the smaller room.

The central toilet area was divided into separate facilities for men and women. Temporary wall construction, behind which were observation areas, is noted at points A through G. The five camera ports are designated by triangles and Roman numerals. Observer ports, denoted by squares and Arabic numerals, were similarly located. The main observation room, position 1, contained various recording equipment.

F. Experimental Variables

1. Shelter Environmental Variables

An outline of the shelter environmental variables evaluated in ES VI is given in Table 4. 4

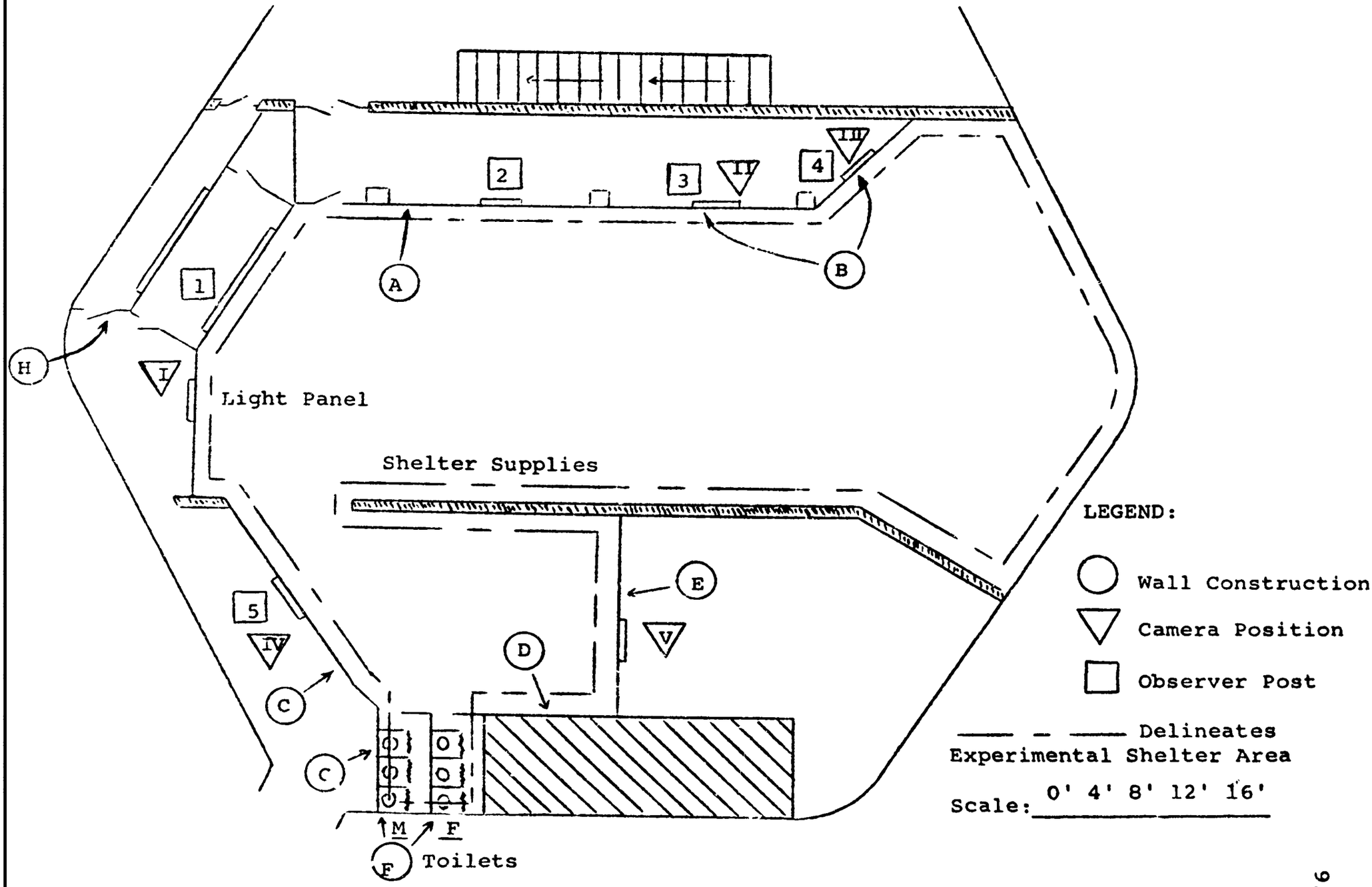

Figure 2. The 300-Person Shelter (ES VI)

Table 4

Shelter Environment Experimental Variables
(Experimental Study VI)

Space - 10 sq. ft./person (includ · ı storage)
Temperature and humidity - MRD ventilation tests
Water - 1 qt./person/day
Food - 700 cal./person/day (approximately 467 cal. Nebraska cracker, 233 cal. Carbohydrate Supplement)
Adjuncts - none
Sanitation - six Sanitation Kit IV (@ 50 persons)
Medication - Medical Kit C (300 persons)
Sleeping pallets - 3/16-in. corrugated fiberboard
Bunks - none
Blankets - none
Bath water - none

The General American Transportation Corporation, MRD division, coordinated the testing of certain ventilation conditions in this study.

Since ES VI was composed of shelterees in the age range of 3-66 years, and since these volunteers were not given thorough physical examinations, it was judged medically infeasible to introduce heat stress as an experimental variable. Ventilation therefore was kept optimal.

2. Shelter Management Variables

The Shelter Management Staff/shelteree ratio was approximately 1:27. An outline of staff responsibilities is presented in Figure 1. As also noted, section sizes of 25, 50, and 75 persons were evaluated.

In-shelter program variables investigated consisted of central vs. sectional control of training lectures, supply distribution, exercise and recreational activities, and religious services. It was not the purpose of ES VI to evaluate content of the training lectures, but rather the scheduling of such within the overall shelter activity program.

Two sleeping arrangements were evaluated. On the first night the shelterees were segregated sexually into two groups: men and boys, women and girls. On the second night, however, sections remained intact, with family groups sleeping in the middle of the section, single males on one side and single females on the other.

G. Observational Procedures

Seven CDR in-shelter observers kept notes on the various shelter program phases. Additional in-shelter observers represented OCD. Outside CDR observers stood watches on a 4-hour basis around the clock.

Electronic measures consisted of activity level and noise level records. A sound film recording was also made. Food and water consumption records, as well as medical records, were maintained. Subjective reports were obtained from the shelterees by daily diary accounts and the administration of structured questionnaires.

III. Results

A. Pre-Shelter Testing

1. Shelter Entrance Questionnaire

Of a sample of 113 shelterees, 102 individuals completed the Shelter Entrance Questionnaire. Preparedness for nuclear survival was fairly low, as indicated in Table 5. Anticipated discomfort factors are listed in Table 6. More than one-half of the subjects selected "not enough fresh air" and "no bathing" as anticipated discomfort factors; and from one-third to one-half of the subjects indicated "too warm," "water," "food," "toilets," and "sleeping" as anticipated sources of discomfort.

2. Personality Testing

Of an adult sample of 79 shelterees, 73 persons (30 males, 43 females, aged 15-65 years) completed 125 items comprising selected sub-scales on the Minnesota Multiphasic Personality Inventory (MMPI). The sub-scales were as follows: Ao, attitude toward others; At-s, manifest anxiety; Re-r, social responsibility; Pd_2, authority problems; Pd_3, social imperturbability; Pd_{4A}, social alienation; Sp, social participation; and Hy_1, denial of social anxiety. Shelteree scores fell within ranges of normal adjustment.

B. In-Shelter Program

1. Shelter Handbook

An experimental handbook was written specifically for ES VI, to be used by the shelter management staff during the study. The handbook was designed to enable a minimally trained staff to organize and operate a 300-man shelter for a week-end study. The rational for the handbook came from experimental findings of past CDR studies, scientific reports of other research organizations, and prepared manuals of the various CD training schools (see References).

The handbook contained information on entry procedures, management and physical facilities, duties of the various staff members, recreational suggestions, training lectures, and a shelter activity schedule.

Table 5

Shelteree Preparedness for Survival
(Experimental Study VI)

Questi n	% Yes	% No
Do you have a family fallout shelter?	1.8 (N=2)	97.2 (N=111)
Have you gone to civil defense classes?	11.6 (N=13)	88.4 (N=99)
In case of an emergency, do you know where there is a community fallout shelter where you and your family could go for protection?	57.8 (N=63)	42.2 (N=46)
Do you have emergency supplies of food and water in your home?	17.4 (N=19)	82.6 (N=90)
Do you have emergency supplies of medicine and first aid equipment in your home?	37.0 (N=40)	63.0 (N=68)

Table 6

Anticipated Discomfort Factors
(Experimental Study VI)

Factor	TOTAL N	TOTAL Mean Ranking	MALE N	MALE Mean Ranking	FEMALE N	FEMALE Mean Ranking
Not enough fresh air	65	3.5	21	3.2	44	3.6
No bathing	54	3.6	9	4.4	45	3.7
Too warm	51	4.0	18	2.9	33	4.5
Water	49	3.9	16	3.2	33	4.2
Food	48	4.5	17	3.4	31	5.3
Toilets	48	3.9	9	5.3	39	3.5
Smells	47	4.2	12	5.2	35	3.9
Sleeping	37	6.0	11	6.0	26	6.0
Space	30	6.7	12	6.1	18	7.2
Too cool	29	6.2	11	5.6	18	6.6
Tobacco smoke	29	5.8	8	6.2	21	5.4
Boredom	28	6.0	12	5.3	16	6.5
Noise	16	8.9	4	9.8	12	8.7
No coffee	16	5.4	4	5.2	12	5.5
Other people	12	8.6	4	7.5	8	9.1
Not enough tobacco	9	8.2	3	9.3	6	7.7
Shelter activities	8	8.5	3	6.7	5	9.6

2. In-Shelter Activity Schedule

An outline of the activity schedule prepared prior to the study is presented in Table 7. However, since the program was general it was not followed in detail. As the study progressed, deviation from the sequence of events occurred. On the basis of the overall test results, the shelter program will be revised and re-tested in future studies.

3. Shelteree Reactions

a. In-Shelter Events

Friday
1600 - 2000

(1) Shelter Management Staff - During this period, the SM was supervising the staff. At approximately 1645 he began his introductory talk. At 1800 he asked Ss to re-form into sections for food and water distribution. At 1915 he announced that the nursery was being set up, and at 1930 he began the first lecture.

The ASM conferred with different staff members at various times. He supervised water distribution and helped set up the medical station. At 1930 he observed the nursery being organized. 8

The DO issued the medical kit at 1615, then conferred with the SM, SLs of E and F, and section representatives. At 1815 he worked with ASM on water distribution.

The DIT spent most of the first two hours conferring with SLs and reading the handbook. He met with section representatives at 1800. At 1915 he set up the nursery, introduced the nursery staff to the children, and organized children by age.

The DS first inventoried supplies and then began making the cup racks alone. He finally recruited assistants to help with this task. He began opening food boxes at 1745 and distributed food to SLs at about 1815.

Table 7

In-Shelter Activity Schedule
(Experimental Study VI)

Entry Phase

	First Hour	Second Hour	Third Hour
SM	Form sections, Refer shelterees for medical aid, Supervise staff	Give introductory talk, Supervise staff	Supervise staff
ASM	Assist SM	Hear SM talk	Assist SM
DO	Set up medical station, Draw sanitation kits, Set up chemical commodes	Hear SM talk, Instruct Section Representatives and task groups on duties	Work with Section Representatives and task groups
DSM	Inventory supplies, Issue sanitation kits and medical kits, Make cup racks	Hear SM talk, Instruct task groups and Section Representatives on duties	Issue food and water to Section Representatives
DIT	Distribute registration forms to SLs, Collect section rosters	Hear SM talk, Instruct task groups and Section Representatives on duties	Prepare evening activity, Set up nursery
SLs	Form sections, Refer shelterees for medical aid, Pass out registration forms, Brief shelterees on general regulations, Prepare roster for SM	Hear SM talk, Select Ss for task groups and Section Representatives	Supervise distribution of individual rations
Ss	Assigned to sections, Receive medical aid, Fill out registration forms, Briefed by SLs	Hear SM talk, Appointments made, Appointed Ss confer with directors	First meal

Time	SM	ASM	DO	DSM	DIT	SLs	Ss
Friday 7:00 PM	Give lecture I	Hear lecture I	Hear lecture I	Hear lecture I	Supervise nursery, Hear lecture I	Lead discussion after lecture I	Hear & discuss lecture I
8:00 PM	Prepare staff meeting	Prepare staff meeting	Prepare staff meeting	Prepare staff meeting	Direct exercise & recreation	Assist in exercise & recreation	Exercise, Recreation
9:00 PM	Eat, Staff meeting	Eat, Staff meeting	Eat, Staff meeting	Eat, Staff meeting, Receive excess rations from sections	Eat, Staff meeting	Eat, Distribute food & water Staff meeting	Eat
10:00 PM	Assist DO in sleep arrangements	Prepare food, water & medical records	Prepare for sleep	Issue fiberboard	Prepare sections for Vespers	Supervise distribution of fiberboard	Sick call, Clean-up
11:00 PM	Lights out	Pass out records, Lights out	Establish security watch	Inventory supplies, Establish night supplies Lights out	Supervise Vespers for all sections, Lights out	Supervise Vespers, Lights out	Vespers, QUIET
12:00 - 7:00 AM	QUIET	QUIET	Security watch	QUIET	QUIET	QUIET	QUIET

(ES VI)

Time	SM	ASM	DO	DSM	DIT	SLs	Ss
Saturday 7:00 AM	Lights on	Lights on	Lights on	Collect fiber-board	Lights on	Collect fiber-board	Arise, Reform sections
8:00 AM	Prepare for days activity, Eat	Prepare for days activity, Eat	Prepare for days activity, Eat	Issue food & water, Eat	Brief medical staff on lecture, Eat	Exercise in sections, Distribute food & water	Exercise, Eat
9:00 AM	Prepare for staff meeting	Diaries	Prepare for staff meeting	Prepare for staff meeting	Prepare for staff meeting	Receives from ASM; Distribute, collect& return diaries to ASM	Clean-up, Diaries
10:00 AM	Staff meeting	Staff meeting	Staff meeting, Task meeting	Staff meeting, Task meeting	Staff meeting, Task meeting	Staff meeting, Distribute water	Water distribution, Sick call
11:00 AM	Hear lecture II	Hear lecture II	Medical lecture II	Hear lecture II	Supervise nursery	Lead discussion after lecture II	Hear lecture II & discuss
12:00 Noon	Eat	Eat	Eat, Prepare for rest period	Eat	Eat, Prepare afternoon program	Distribute food & water	Eat

(ES VI)

Time	SM	ASM	DO	DSM	DIT	SLs	Ss
1:00 PM	Control lights, Rest	Rest	Rest	Rest	Rest	Rest	Rest
2:00 PM	Exercise	Exercise	Exercise	Exercise	Nursery, Direct exercise, Plan evening recreation	Exercise	Exercise, Recreation in section, Planning evening recreation
3:00 PM	Review & plan activities	Evaluate records	Review duties	Review duties	Supervise evening planning & Sunday services	Supervise informal discussion, Recreation planning	Informal discussion, Recreation planning
4:00 PM	Eat	Eat	Eat	Eat	Eat	Distribute food & water	Eat
5:00 PM	Free time	Free time	Free time	Free time	Prepare evening program	Free time	Free time
6:00 PM						Section activities	Water distribution
7:00 PM	Recreation	Recreation	Recreation	Recreation	Direct nursery, Recreation	Assist recreation	Recreation
8:00 PM	Prepare staff meeting	Prepare staff meeting	Prepare staff meeting	Prepare staff meeting	Direct nursery, Recreation	Assist recreation	Recreation

Time	SM	ASM	DO	DSM	DIT	SLs	Ss
9:00 PM	Eat, Staff meeting	Eat, Staff meeting	Eat, Staff meeting	Eat, Staff meeting, Receives excess rations from sections	Eat, Staff	Distribute food & water, Staff meeting	Eat
10:00 PM	Assist in sleep arrangements	Collect records	Prepare for sleep	Issue fiberboard	Prepare sections for Vespers	Distribute fiberboard	Sick call, Clean-up
11:00 PM	Lights out	Pass out records, Lights out	Establish security watch, Lights out	Inventory supplies, Establish night supplies Lights out	Supervise Vespers for all sections, Lights out	Supervise Vespers, Lights out	Vespers, QUIET
12:00 - 7:00 AM	QUIET	QUIET	Security watch	QUIET	QUIET	QUIET	QUIET
Sunday 7:00 AM	Lights on	Lights on	Lights on	Collect fiberboard	Lights on	Collect fiberboard	Arise
8:00 AM	Prepare for day's activity, Eat	Prepare for day's activity, Eat	Prepare for day's activity, Eat	Issue food & water, Eat	Brief religious assistants on day's service, Eat	Exercise in sections, Distribute food & water	Exercise, Eat

(ES VI)

Time	SM	ASM	DO	DSM	DIT	SLs	Ss
9:00 AM	Prepare for staff meeting	Diaries	Prepare for staff meeting	Prepare for staff meeting	Prepare for staff meeting	Receive from ASM; Distribute, collect, return diaries to ASM	Clean-up, Diaries
10:00 AM	Staff meeting	Staff meeting	Staff meeting, Task meeting	Staff meeting, Task meeting	Staff meeting, Prepare religious service	Staff meeting, Distribute water	Water distribution, Sick call
11:00 AM	Religious service	Religious service	Religious service	Religious service	Nursery	Religious service	Religious service
12:00 Noon	Eat, Control lights	Eat	Eat, Prepare for rest period	Eat	Give lecture III to SLs,	Distribute food & water	Eat
1:00 PM	Rest	Rest	Rest	Rest	Rest	Rest	Rest
2:00 PM	Hear lecture III	Hear lecture III	Hear lecture III	Hear lecture III	Nursery	Give lecture III	Hear lecture III
3:00 PM	Questionnaire, Special activities	Administer questionnaire	Questionnaire, Special activities	Questionnaire, Special activities	Nursery	Questionnaire, Special activities	Questionnaire, Special activities
4:00 PM	Eat, Clean-up	Eat, Clean-up	Eat, Clean-up	Eat, Clean-up	Eat, Clean-up	Eat, Clean-up	Eat, Clean-up
5:00 PM	Prepare to exit	Pass out records	Prepare to exit	Inventory supplies	Prepare to exit	Turn in supplies	Prepare to exit
6:00 PM	Secure shelter, Exit	Secure shelter, Exit	Secure shelter, Exit	Secure shelter, Exit	Secure shelter, Exit	Secure shelter, Exit	Secure shelter, Exit

The SLs seated their sections and distributed registration cards. Then they collected registration cards and made task appointments. The SLs supervised food and water distribution in their own sections, but some failed to keep records. After the first lecture, there was some discussion in sections.

(2) Shelterees - The shelterees entered the shelter and moved as directed into their section areas. During the first hour they filled out registration forms, received their shelter bags and were briefed on the shelter rules by their respective section leaders. Shelterees in the smaller sections were more easily controlled than those in the larger ones. Generally speaking, non-white shelterees segregated themselves within sections. Subsequent to initial procedures, the shelterees became louder and more mobile.

After listening to the introductory remarks by the SM, many of the shelterees wandered around acquainting themselves with their new environment and each other, while others remained in their section area questioning the SL. Most of them were eating at the end of the third hour. After the shelterees had eaten, activity increased. The children were taken to the nursery while the adults attended the SM's lecture.

2000 - 2400

(1) Shelter Management Staff - At 2030 the SM interrupted exercises to explain the correct use of chemical commodes. He conferred with the ASM, DO, and DSM. At 2130 he announced that the air-conditioner would be turned on. A staff meeting was held at approximately 2200. The SM supervised preparations for sleep.

The ASM was in several conferences with the SM, DO, DS, MRD observers, and CDR observers. He helped issue corrugated fiberboard for sleeping, distributed arm bands to the night watch, and helped arrange medical supplies.

The DO engaged in conferences, supervised water distribution, then attended staff meeting. At 2230 he explained correct use of toilets and supervised the first night's sleeping arrangements.

The DIT attended conferences and the staff meeting, and spent most of this period supervising the exercises and recreation.

The DSM attended conferences and the staff meeting, supervised water distribution, and had supplies moved into position to create barriers between males and females for sleeping.

The SLs participated in exercises and recreation, recorded water dispensing in their sections, held Vespers, and assisted in the sleeping arrangements.

(2) Shelterees - The shelterees participated in isometric exercises, and later in a group sing. After the group sing, shelterees received the evening's food and water rations.

The individual sections held Vespers and received the last water rations of the day. The DO explained the sleeping arrangement, and the Ss began placing the fiberboard mats on the floor. After lights out some of the women were still going to the rest room.

Saturday
2400 - 0400

Most shelterees slept soundly from midnight until 0400. There was very little movement except for occasional trips to the rest rooms.

0400 - 0800

(1) Shelter Management Staff - During the last hour of this period, the lights were turned on; the SM asked Ss to stay in their sections during the day; the DO directed clean-up; the DSM collected cardboard mats and supervised food distribution; and the SLs instructed their sections on the day's activities.

(2) Shelterees - Most of the shelterees slept soundly until 0700, although the females seemed to be more restless than the males. Some of the females were talking to the Security Watch; some were smoking.

About an hour before lights on, sleeping was quieter and there was almost no activity. Several men began to get up during the latter part of the hour before the lights were turned on at 0658. After arising, the shelterees began cleaning up. Some sections were sitting and talking; others were exercising. Water dispensing was begun within the first hour.

0800 - 1200

(1) Shelter Management Staff - The SM met with the ASM, DIT, and SLs, and held a staff meeting. He then announced exercises. He introduced the doctor for Lecture No. 2.

The ASM conferred with the SM, DIT, and SLs, passed out the diaries and gave instructions to the Ss on the diary procedure. He attended a staff meeting.

The DO held a meeting of the Security Watch and prepared for radiological training. He instructed six Ss on use of the radiological equipment, then attended staff meeting, and put up a cardboard screen around a woman who fainted.

The DIT talked with various Ss, and attended the staff meeting. The DSM distributed and collected pencils, attended the staff meeting and supervised water distribution.

The SLs kept food and water records, and arranged boxes to divide the sections. They also attended the staff meeting and supervised water distribution.

(2) Shelterees - Food and water were distributed to the shelterees. The ASM explained the diary forms, and the Ss began filling them out. Afterwards, some sections exercised, and the Security Watch attended a lecture on radiation detection. Later the Ss engaged in various pastimes such as games, talking, and sleeping. Some of the children "rode" the bicycle exhaust fan. The medic gave a medical lecture during this period. Near the end of the last hour in this period, a woman fainted and was attended by the doctor.

1200 - 1600

(1) Shelter Management Staff - The SM supervised arrangements for the rest period, conferred with DO and ASM, and rested. After the rest period, he talked to ASM and SLs. At 1445 he telephoned the outside observers concerning a leaking commode.

The ASM conferred with the DO and SM, rested, and talked to Ss.

The DO turned down the lights for the rest period, met with the DIT, DSM, and SLs, and conversed with Ss.

The DIT started the exercises and spent most of this period in conversation.

The DSM spent most of this period resting and talking.

The SLs supervised food and water distribution, and spent most of the time in conversation.

(2) Shelterees - The shelterees participated in physical exercises and a group sing. Food and water were distributed, and after eating, the shelterees began playing cards and checkers, talking, and resting. The lights were turned off for the rest period, which lasted until 1500, and then the Ss participated in some light exercises. The remainder of the period, until the next distribution of food and water, was spent sitting and talking or playing quiet games.

1600 - 2000

(1) Shelter Management Staff - At 1645 the SM called out about a leaking commode, and at 1700 the DSM and DO had the commode removed from the shelter.

The ASM helped with the commodes and worked on records.

The DO helped with the commodes and spent most of the time conversing with Ss.

The DIT spent most of the time conversing with Ss, and at 1900 introduced the talent show and recreation hour.

The DSM helped with commodes, supervised water distribution, and conversed with Ss.

The SLs spent most of the time in conversation.

(2) Shelterees - Food and water were dispensed, and the shelterees were given free time. Most of the Ss sat and talked. A few apparently slept despite the noise. In the smaller room a male quartet practiced for the recreation hour. Other Ss also prepared for the recreation hour at this time. There appeared to be more group activity in the larger groups than in the smaller groups. Members of Section D seemed to interact less than members of other sections.

The Ss enjoyed a talent program at the end of this period.

2000 - 2400

(1) Shelter Management Staff - The SM held a staff meeting. At 2145 he asked Ss to lie down for sleeping space estimation.

The ASM attended a staff meeting. The DO attended staff meeting, helped move empty water drums, and helped make sleeping arrangements. The DIT attended the staff meeting.

The SLs attended the staff meeting, distributed food and water, held Vespers, and distributed cardboard.

(2) Shelterees - After the recreation hour, the children were taken to the nursery to rehearse singing for Sunday's church service. Food and water were distributed. The fiberboard was distributed and Ss participated in Vespers before lights out.

Sunday
2400 - 0400

During the first and second hours of this period, most of the Ss slept. Some were going to the toilet area and some were getting water. During the remainder of the period, very few Ss were not sleeping.

0400 - 0800

(1) Shelter Management Staff - Shortly after lights were turned on, the SM met with the DIT and ASM. Then he cleaned up after some sick children.

The ASM helped the DSM collect fiberboard. The DO turned on the lights and helped the DSM and SLs. The DSM stacked supplies and collected fiberboard. The SLs supervised clean-up and food and water distribution.

(2) Shelterees - Ss were still sleeping soundly the first hour of this period. During the second hour, some of them began arising. After lights on, activity increased. Some of the children were sick. Food and water distribution was begun.

0800 - 1200

(1) Shelter Management Staff - At 0830 the SM held a staff meeting, then asked Ss to form into sections. He later had conferences with the DIT, SLs, ASM, and the religious leader. At 1100 he quieted the Ss for the religious services.

The ASM moved sick children to a new sick bay area, talked to the DIT and the religious leader, passed out diaries, and sang in the choir. The DO helped move the sick bay and set up a podium for the religious services. The DIT conferred with the SM and religious leader in planning religious services and helped with clean-up. The DSM helped pass out diaries and spent most of the period resting. The SLs passed out diaries and distributed songs for religious services. SLs of sections B and E sang in the choir.

(2) Shelterees - After eating, most of the Ss sat down. Some went to sleep again, and some were exercising within their sections. Later the Ss completed diaries, sat and talked, and played cards while some prepared for the church service. The church service consisted of choir singing, scripture reading, and a sermon. Ss were talking and moving about after the church service.

1200 - 1600

(1) Shelter Management Staff - The SM held a staff meeting at 1245, rested during quiet hours, announced the schedule for the rest of the day, and conferred with the ASM, DO, and DIT.

The ASM rested during quiet hours and wandered around talking to Ss.

The DO turned down the lights and quieted Ss for the rest period, checked over the radiological kit, and spert the rest of the time resting and talking.

The DIT spent most of this period resting and talking.

The DSM rested, then distributed and collected questionnaires.

The SLs supervised food and water distribution, gave Lecture No. 3 to their sections, and assisted in questionnaire processing.

(2) Shelterees - Food and water were distributed. The shelterees ate, talked, rested, cleaned up, and played cards and checkers. The lights were turned off for the rest period, and the shelterees were quiet.

After the rest period, there was a centralized exercise program with about 80% participation. Lectures were then given in some groups. The shel erees filled out questionnaires during the last hour of this period.

1600 - 1800

(1) Shelter Management Staff - The SM rested, wandered around, conferred with the DIT, informed Ss of exit time, asked Ss to arrange themselves alphabetically by sections, and supervised exit.

The ASM taped up the radiological kit, stacked forms, passed out questionnaires, and supervised exit.

The DO supervised clean-up. The DIT announced recreation to help pass the time until exit. The DSM checked

supplies and records, stacked supplies, and rested. The SLs supervised clean-up, arranged sections in alphabetical order, and supervised exit.

(2) Shelterees - Food and water were distributed. There was an increase in noise and activity. The SM staff directed the cleaning up of the shelter area and the re-organization of the shelter supplies. The SM made an announcement about personal items and the latrines. Most of the Ss were then sitting around the wall. A group sing was held with good participation. The Ss were addressed by the Project Director, arranged in alphabetical order, and released from the shelter at 1745. All of the Ss were out of the shelter by 1800.

b. Shelteree Diaries

Shelterees completed diaries twice during the study, on Saturday and Sunday mornings, respectively. Most of the diary information was more explicitly contained in the Post-Shelter Questionnaire, and this type of information will be discussed in the section to follow.

c. Post-Shelter Questionnaire

The Post-Shelter Questionnaire was similar to those used in earlier experimental studies.

The questionnaire was administered in the shelter just prior to emergence to 171 persons (80 males, 91 females), fifteen years of age or older. Because 10 of the subjects failed to follow directions correctly, their responses were deleted from the analysis of those questions properly answered. A few subjects refrained from answering some questions. However, unless otherwise noted the percentages quoted are based on the 171 subjects who completed the questionnaire.

(1) Adjustment to Shelter Living - In Part I of the questionnaire an effort was made to get an idea of the subject's adjustment to shelter life. The first question required that each subject estimate the number of days he could remain in the shelter

under the same conditions. Table 8 presents the results of this question for males and females, and the total group. The median estirate for males was ten days; for the females, five days.

Several questions revealed a favorable attitude on the part of the subjects toward their stay in the shelter. Eighty per cent said that they would have volunteered to stay in the shelter if they had known what it would really be like, and 72 per cent indicated that they would be willing to volunteer to stay in the shelter again.

The majority of shelterees (53 per cent) seemed to think that the adult group found it difficult to live in the shelter, and 34 per cent of the respondents thought that many of the children found it hard to live in the shelter. These results are presented in Table 9.

The last question in Part I asked the shelterees to list any items which they felt definitely should be added to the shelter stocks. The three principal suggestions were: (1) more varied food, (2) bedding and better sleep conditions, and (3) reading and recreational materials.

(2) Primary Discomfort Factors - The second part of the questionnaire was designed to ascertain the factors contributing to the discomfort of the shelterees. The subjects were asked to choose from the seventeen factors presented, and to rank those they considered to be discomforts. The results are presented in Table 10.

Three factors were chosen by more than one-third of the subjects. These points together with a more detailed analysis of each, are as follows:

Sleeping was the greatest discomfort factor, being selected by 49 per cent of the subjects. A more detailed breakdown of sleep condi ions revealed four discomfort reasons selected by more than 25 per cent of the subjects: (1) the floor was not soft enough, (2) sleeping made parts of the body sore, (3) it was too crowded, and (4) no pillow.

Table 8

Shelteree Estimates of Tolerance
for Continued Confinement
(Experimental Study VI)

Additional Days	Number of Estimates		
	Total Group	Males	Females
0-4	60	17	43
5-9	31	11	20
10	28	17	11
15	22	15	7
20	5	3	2
30	23	17	6
Total Responses	169	80	89
Mean Estimate	10.1 days	13.3 days	7.2 days
Median Estimate	7.0 days	10.0 days	5.0 days

Table 9

Shelteree Evaluation of
Shelter Adjustment
(Experimental Study VI)

Question	Per Cent Yes		
	Total Group	Males	Females
Would you have volunteered to stay in the shelter if you had known what it would really be like?	80.2 (N=134)	83.3 (N=65)	77.5 (N=69)
Would you volunteer to stay in this shelter again sometime?	72.3 (N=120)	77.9 (N=60)	67.4 (N=60)
Do you think that many of the children find it hard to live in this shelter?	44.4 (N=75)	50.6 (N=40)	38.9 (N=35)
Do you think that many of the young people find it hard to live in the shelter?	29.2 (N=50)	25.0 (N=20)	33.0 (N=30)
Do you think that many of the adults find it hard to live in the shelter?	53.2 (N=91)	48.8 (N=39)	57.1 (N=52)

Table 10

Shelteree Indications of Discomfort
(Experimental Study VI)

Discomfort Factor	Total Group N	Total Group Mean Ranking	Male N	Male Mean Ranking	Female N	Female Mean Ranking
Sleeping	84	2.45	43	2.00	39	3.03
Toilets	80	2.96	36	3.33	45	2.84
No bathing	70	3.43	23	4.04	47	3.13
Boredom	46	4.00	25	3.32	21	4.81
No coffee	45	3.44	18	3.89	27	3.15
Dirty	45	4.27	17	3.94	28	4.46
Space	43	4.74	20	4.35	23	5.09
Noise	42	5.69	21	4.81	21	6.57
Water	35	4.91	17	4.41	18	5.39
Too cool	33	5.15	7	10.29	26	3.77
Too warm	27	3.00	14	3.00	13	3.00
Smells	26	6.69	3	8.25	18	6.00
Tobacco smoke	25	4.52	12	6.17	13	2.92
Not enough fresh air	22	6.59	11	5.64	11	7.55
Not enough tobacco	18	4.17	10	3.90	8	4.50
Shelter activities	16	6.44	10	6.40	6	6.50
Other people	12	9.75	7	10.29	5	9.00

Forty-seven per cent of the subjects indicated the toilets to be a discomfort factor. Two factors emerged as causing distress: (1) the smell, and (2) the toilet was too high.

The lack of bathing facilities was mentioned by 41 per cent of the subjects. Two aspects of not bathing came to the fore as causes for discomfort: (1) could not wash face, and (2) could not take a bath or shower.

The subjects were asked to indicate whether the lectures given to the shelter as a whole or the lectures given in the individual sections worked best. Of the 133 subjects who answered this question, 38 per cent said the lectures given to the whole shelter worked best, and 62 per cent said the section lectures worked best.

(3) Sleep Arrangements - The shelterees also were asked to indicate which of the two sleeping arrangements employed during the study they liked best. The arrangement which consisted of sleeping by sections, with family groups separating the single males from the single females in each section, was chosen by 66 per cent of the 155 subjects answering the question. Of the same 155 subjects, 70 per cent said that they got a better night's sleep under this sectional sleeping arrangement.

(4) Shelteree Opinions of the Study - Part III of the questionnaire asked the Ss to give their opinion of certain aspects of the study. The first question was concerned with the optimum section size. Of those who expressed an opinion, 54 per cent thought that the 25-man section size was best, while 33 per cent said that the 50-man section was best. Only 13 per cent favored the 75-man section size.

Shelterees were asked how they felt about living in an integrated shelter. Responses were divided into five categories. The largest group, composing 50 per cent of the total, felt that things had been better than they had expected. Thirty-four per cent said that it had been fine, and 13 per cent

said that integration was all right under emergency conditions

One question asked pointedly whether the subjects thought shelters should be segregated or integrated. Of the 160 subjects who answered the question, 29 per cent felt that shelters should be segregated, and 71 per cent maintained that shelters should be integrated.

4. Medical History

Medical Kit C was used in Experimental Study VI. The items most frequently used were aspirin, phenobarbital, alcohol, and gauze pads.

a. Medical Complaints

Medical complaints and treatment were recorded on a standard form by the shelter doctors or nurses. Headache and nausea were the predominant complaints. These two categories comprised 89% of the medical complaints in the shelter. A summary of the medical complaint record is presented in Table 11.

During the study, the medics improvised a sterilizer from an emptied can of sodium bicarbonate. Using the cracker can-opener they punched holes in the top half of the can. They then soaked a large piece of gauze in alcohol and placed it in the perforated can. Upon ignition of the gauze, the medics were able to boil water for treatment of a boil.

The medical station was established in the smaller room of the shelter upon shelter entrance. This location proved to be too warm and too near the toilet facilities; the station was then set up in the rear corner of the larger room. Large pieces of corrugated fiberboard were set on end in order to form a screen around the area. This arrangement proved satisfactory.

Table 11

Summary of Primary Items Reported on
Medical Complaint Record
(Experimental Study VI)

	Nature of Complaint											
	Headache			Nausea			Others			Total		
Day	Tot.	M	F	Tot.	M	F	Tot.	M	F	Tot.	M	F
1	24	7	17	1	1	-	3	3	-	28	11	17
2	119	49	70	9	3	6	14	5	9	142	57	85
3	14	4	10	30	10	20	2	2	-	46	16	30
Total	157	60	97	40	14	26	19	10	9	216	84	132

b. Post-Shelter Medical Report

The shelter physicians submitted a report of their observations following completion of the study. This report is presented below in its entirety:

"In general, the arrangements for ventilation, space per person, sleeping, and recreation were very good in our opinion.

"In regard to the food, we felt as did most, that the crackers were rather unpalatable. This resulted in some of the group, predominatly women and female children, not eating the crackers. The mild epidemic of nausea and vomiting on the last morning correlated well with not eating the crackers.

"As expected, the major complaint was headache, and the major medication dispensed was aspirin, grains X or XV. No major illness was observed.

"The medical kit had several notable lacks. Band-aids, or at least adhesive tape, would seem indicated, especially in view of the type of packaging of the crackers. A liquid form of surgical soap (Phisohex-Winthrop, etc.) would be much more useful, and would be adequately preserved, I believe. We felt that several other drugs would be helpful, especially Benadryl, 25 or 50 mgm. capsules and elixir; this drug is remarkable for its antipruritic, antinausea, sedative, and local anaesthetic (gargle) actions, and would have been useful for the nausea and vomiting we encountered. Some form of cardiovascular medication should be available also: adrenalin, aqueous 1:1000, a digitalis preparation and nitroglycerin, 0.5 mgm.

"The remarkable decrease in medical complaints during the last 5-6 hours of the study was also interesting and more or less expected. Most complaints were somatic symptoms of discomfort and tension, and perhaps somewhat enhanced by the ready availability of professional help.

"Toward the end of the study the sick bay was moved to one of the cooler locations in the shelter and cardboard walls were used to semi-isolate this area thus

permitting shelterees to lie down in close proximity to the physicians. This worked out quite well.

"In children we were impressed by how regularly nausea and retching were associated with not having eaten crackers. As far as we could tell no one had these complaints who had eaten his share of the crackers (this did not hold as well for the adults)."

C. Observer Evaluation

After completion of the study, written reports were submitted by both the OCD training school representatives and the in-shelter CDR staff observers. A summary of these reports is presented here.

The general consensus of the observers was that pre-shelter processing and entry went well, but that upon shelter entry organization and training should have commenced immediately.

1. Facilities

Space was not accurately assigned to the sections according to section size; thus the larger sections were too crowded and the smaller ones had more space than they needed. The observers agreed that ventilation was unrealistically good and that smoking should be controlled. Cigarette smoke irritated the eyes and nasal passages of some shelterees, and cigarette butts thrown on the floor caused a sanitation problem. The food and water rations were adequate, but it was suggested that more be supplied for the sick and injured.

The observers agreed that the chemical commodes were too high, hard for children to use, and that they had a bad odor. Several observers suggested that the commodes be made of metal rather than fiberboard, because if the plastic liners leaked the fiberboard drums would become soggy and collapse. A demonstration of the proper use of the commodes was needed.

Additional needed supplies suggested by the observers were brooms, mops, ash trays, buckets, medical supplies, recreational supplies, and more comfortable sleeping facilities for the sick.

2. Management Staff

Several observers commented that the SM was not sufficiently forceful and was unable to effectively control the shelter. Comments on the DO were generally favorable. The DSM and SLs could have delegated more of their duties. In general, there was not enough communication among staff members, and leadership was poor. The opinion on optimum group size ranged from 10 to 30, with 25 being the most frequent choice.

3. Handbook

In the opinion of the CDR observers, the Shelter Management Handbook needs revision and further testing.

4. Activities

According to the observers, the sectional distribution of food and water worked well. The siphons supplied for water distribution were not acceptable because they were too short to effectively reach the bottom of the water drums and because of difficulty in starting the siphon action.

It was observed that the sectional sleeping arrangement with families together was preferred. In the opinion of the observers the lectures were poor. More emphasis on nuclear warfare was needed. The exercise and recreational programs were well received, but there was a need for more recreational materials, especially books. Concerning the nursery, it was reported that the children were not effectively controlled. The religious activities were well received.

Lecture communications were poor. Comments on the schedule outlined in the management handbook were conflicting, ranging from too many activities to too much free time. The operation of the security force went well, and racial integration within the shelter caused no problem.

5. Health and Sanitation

It was believed that the prevalent sickness among young children was caused by not eating the crackers and/or by eating only the carbohydrate supplement. In general, it was observed that sanitation was poor.

D. Shelter Management Staff Evaluation

Written reports were submitted by all members of the management staff within ten days after completion of the study. A summary of these reports is presented below. 12

Most members of the management group thought that the entry phase was rather confused and should be more specifically checklisted.

Space was unequally divided among the sections. Sections E and F were crowded into one end of the shelter, while Section D, at the other end, had extra room. The sick bay and the nursery should not have been located next to the commode area.

Ventilation was considered very good, except for the fact that some shelterees complained of it being too cool at night. The lack of smoking regulations created a sanitation problem.

In the opinion of the management staff the crackers were unacceptable, but the carbohydrate supplement was quite popular. There were few complaints about the taste of the water, but the siphons proved to be inadequate for drawing water directly into the small cups. The best method was to pour water from the drums into empty food tins, and then into the cups. The Lily cup was preferred. Many of the water drums were not filled to capacity. Additional supplies that were recommended included masking tape, pencils, paper, emergency lights or candles, knives, ammonia inhalers, iodine, bandaids, and cough medicine.

It was suggested that the metal drums be used for all commodes in case a leak develops in the plastic bag liners. More detailed instructions as to the proper use of the commodes would have alleviated many of the sanitation problems that evolved. In general, sanitation in the shelter was poor. The addition of mops, brooms, rags, and dustpans would help in this regard. Plastic bags and gloves were needed for handling the carbohydrate supplement.

The opinion of the management staff was that the Shelter Manager was not forceful enough. His control would have been enhanced by the establishment of a centralized point of operations. The DO was given too many duties. Radiological monitor training should have been a separate assignment, rather than a

task of the DO. The responsibilities of each staff member were not clearly delineated; cooperation was poor; and the chain of command tended to break down.

The general consensus of the management team was that sleeping within the sections was preferred to shelter-wide segregation by sex. Lectures, also, were more effectively handled within the sections, although the presentations were too lengthy. Agreement was almost unanimous that a section of 25-30 was the most desirable size. 13

The exercise program was useful, but too strenuous for most of the shelterees. The recreation and religious activities programs were well received.

The provision for a nursery seemed to be beneficial to both the children and the adults, although the nursery sessions were too long.

The sickness of many children apparently was caused by their not eating the crackers and/or eating only the candy drops.

Racial integration did not present any particular management problems.

E. Environmental Variables

1. Food and Water Records

The women and children ate considerably fewer crackers than the allotted ration for the last two days. The deviation of consumption from allotment is shown in detail in Table 12. The Post-Shelter Questionnaire revealed the three primary negative comments to be: (1) no variety, (2) not enough taste, and (3) too dry.

Difficulty arose in getting the young children to eat the crackers; the medics attempted to solve this problem by making a mash of water and crackers, and flavoring the mixture with the carbohydrate supplement (candy drops).

The carbohydrate supplement was well received by the shelterees, especially the children. Shelterees consumed approximately the total ration allotted (see Table 13).

Table 12

Daily Mean Caloric Consumption of the Survival Cracker
(Experimental Study VI)

Day	Ration*	Men (N=86)	Women (N=89)	Children (15 & under) (N=123)	Total Group (N=298)**
1 (1600-2400) hours	Calories	231.5	231.9	222.1	227.7
	Crackers	10.6	10.6	10.2	10.4
2 (0001-2400) hours	Calories	368.5	293.0	272.7	306.4
	Crackers	16.9	13.4	12.5	14.0
3 (0001-1800) hours	Calories	247.6	174.5	150.7	185.8
	Crackers	11.3	8.0	6.9	8.5

*Nebraska wheat-corn-flour cracker.
**Records not available for two Ss.

Table 13

Daily Mean Caloric Consumption of
Carbohydrate Supplement
(Experimental Study VI)

Day	Ration	Men (N=86)	Women (N=89)	Children (15 & under) (N=123)	Total Group (N=298)*
1 (1600-2400) hours	Calories	94.3	94.3	89.98	92.5
	Drops	3.97	3.98	3.8	3.9
2 (0001-2400) hours	Calories	205.9	206.2	211.6	208.0
	Drops	8.7	8.7	8.9	8.8
3 (0001-1800) hours	Calories	142.5	149.3	142.6	144.6
	Drops	6.0	6.3	6.0	6.1

*Records not available for two Ss.

Only positive comments concerning the drops were found in the daily diaries. Scattered complaints of "too hard," "made mouth sore," and "made mouth dry " were listed in the Post-Shelter Questionnaire.

Scattered comments in the diaries and post-shelter questionnaires indicated that the main complaints concerning water were: (1) too warm and (2) bad taste. Data in Table 14 indicates, however, that almost all the allotted rations were consumed, bearing in mind that 3 cups/person were allotted Friday, 6 cups/person on Saturday, and 4 cups/person on Sunday. 14

2. Sanitation Kit IV

a. The Chemical Commode

During the study 12 commodes were used (see Tables 15 and 16). The average weight of the commodes used by males was 82.17 pounds; by females, 91.5 pounds.

Though put into service at approximately the same time, two of the last three commodes (Nos. 4 and 6) used by males were approximately one-fourth full at the conclusion of the study, and the remaining commode (No. 5) was two-thirds filled. The evident preference by the males for one commode appears to have been based on location (No. 4 was last in line) and odor (former commodes in No. 4 and No. 6 areas had ruptured and leaked).

It was necessary to replace commodes used by females more quickly than those used by males, most likely because greater bulk such as toilet tissue and sanitary pads went into the toilets serving the females.

The commode chemical used was the OCD stocked Weladyne. No other chemicals were used in this study. The OCD instructions concerning the amount and method of use of Weladyne were followed.

Analysis of the Post-Shelter Questionnaire indicated that the commodes were one of the major sources of complaint. Foremost reason for complaint was the odor, followed by complaints of the toilet being too high and its seeming uncleanness.

Table 14

Daily Mean Water Consumption*
(Experimental Study VI)

Day	Men (N=86) No. Cups	Women (N=89) No. Cups	Children (15 & under) (N=123) No. Cups	Total Group (N=298)** No. Cups
1 (1600-2400) hours	2.9	3.0	3.0	3.0
2 (0001-2400) hours	5.8	5.3	5.7	5.6
3 (0001-1800) hours	3.7	3.3	3.4	3.5

*1 cup = approximately 6 ounces.
**Records not available for two Ss.

Table 15

Chemical Commode Evaluation
(Experimental Study VI)

(Male)

Commode Number	Type Drum	Date Put Into Use		Date Sealed Off		% Full	Gross Weight When Sealed Off	Evaluation on Tag
1	Fiberboard	1630	7/31/64	1645	8/1/64	60%	86 lbs.	Plastic bag assembly ruptured. Fiberboard drum weakened from leak. Removed from shelter at 1645 on 8/1/64. No comments on odor.
2	Fiberboard	1630	7/31/64	2130	8/1/64	85%	98 lbs.	No comments on odor.
3	Fiberboard	1630	7/31/64	2230	8/1/64	75%	125 lbs.	Both plastic bag assemblies ruptured (cause of rupture not known). Removed from shelter at 2230 8/1/64, no comments on odor.
4	Water Drum	1645	8/1/64	1700	8/2/64	25%	53 lbs.	No comments on odor.
5	Water Drum	2130	8/1/64	1700	8/2/64	67%	81 lbs.	No comments on odor.
6	Water Drum	2230	8/1/64	1730	8/2/64	20%	50 lbs.	No comments on odor.

Table 16

Chemical Commode Evaluation
(Experimental Study VI)

(Female)

Commode Number	Type Drum	Date Put Into Use		Date Sealed Off		% Full	Gross Weight When Sealed Off	Evaluation on Tag
1	Fiberboard	1630	7/31/64	1510	8/1/64	75%	86 lbs.	No comments on odor
2	Fiberboard	1630	7/31/64	1510	8/1/64	75%	104 lbs.	No comments on odor
3	Fiberboard	1630	7/31/64	1645	8/1/64	75%	97 lbs.	No comments on odor
4	Water Drum	1510	8/1/64	1700	8/2/64	67%	90 lbs.	No comments on odor
5	Water Drum	1510	8/1/64	1700	8/2/64	67%	87 lbs.	No comments on odor
6	water Drum	1645	8/1/64	1730	8/2/64	67%	85 lbs.	No comments on odor

b. Sanitation Kit IV Supplies

(1) Toilet Paper - One-third of the toilet paper supply was used during the 50 hour period. No exact reason for this high usage rate is known, but the following conditions were observed and are probably the cause: (a) poor inventory control; (b) the toilet paper was not under the direct supervision of the DSM, but rather the entire supply of paper was placed in a location accessible to almost all of the shelterees, who used it for a number of purposes other than its intended use.

(2) Commode seat - The Post-Shelter Questionnaire indicated that a small percentage of shelterees felt the seat to be uncomfortable.

(3) Can opener - The can opener was adequate, but left a very jagged edge on the food tin.

(4) Sanitary pads - The use of this item was normal for the number of female shelterees, probably because the medics supervised distribution. The OCD stocked quantities of this item probably would have been sufficient for a two-week duration.

(5) Hand cleaner - Over one-half of the stocked supply was utilized in the 50-hour period. If this item is to be used by the shelter population as a hand cleaner and to be issued to all shelterees before meals the quantity supplied is insufficient. The term "hand cleaner" may be misleading, for it does not clean the hands when applied, but only sanitizes them. It is recommended that the hand cleaner be dispensed to those servicing the commodes, to food service personnel, and to other shelterees only once a day.

(6) Plastic gloves - Adequate.

(7) Water siphon - It was the concensus of all concerned with the dispensing of water that the hose is at least a foot too short and that siphoning directly into an individual cup is an inadequate method.

(8) Cups and lids - Breakage of the plastic cups was a problem, but the use of the newly devised cup racks did reduce quite considerably the number of broken or cracked cups. Marking cups with lipstick proved to be unsatisfactory.

3. Noise Level Record and Activity Record

a. Noise Level

During this study, continuous recordings of noise level variations were taken. The data are presented in terms of millivolts and are intended to show relative changes in noise level, rather than absolute values. These data were averaged and graphed for each hour (Figure 3).

The noise level variations were a function of the shelter schedule, peaks occurring during times of conversation and recreation, and dips occurring during rest, food distribution, and lectures.

The general decline in noise levels on the third day was verified by direct observation. Factors of adaptation, fatigue, sickness, and boredom may partially explain this trend.

b. Activity Level

A Williams/Peacock Activity Recording Device was installed in the shelter in order to measure general motor activity. However, the constant vibration of the plastic ventilation ducts invalidated the activity readings, and consequently they are not reported here.

4. Ventilation Tests

Ventilation test data are being currently evaluated by the General American Transportation Corporation. As of the present date, no information has been received on the data analysis.

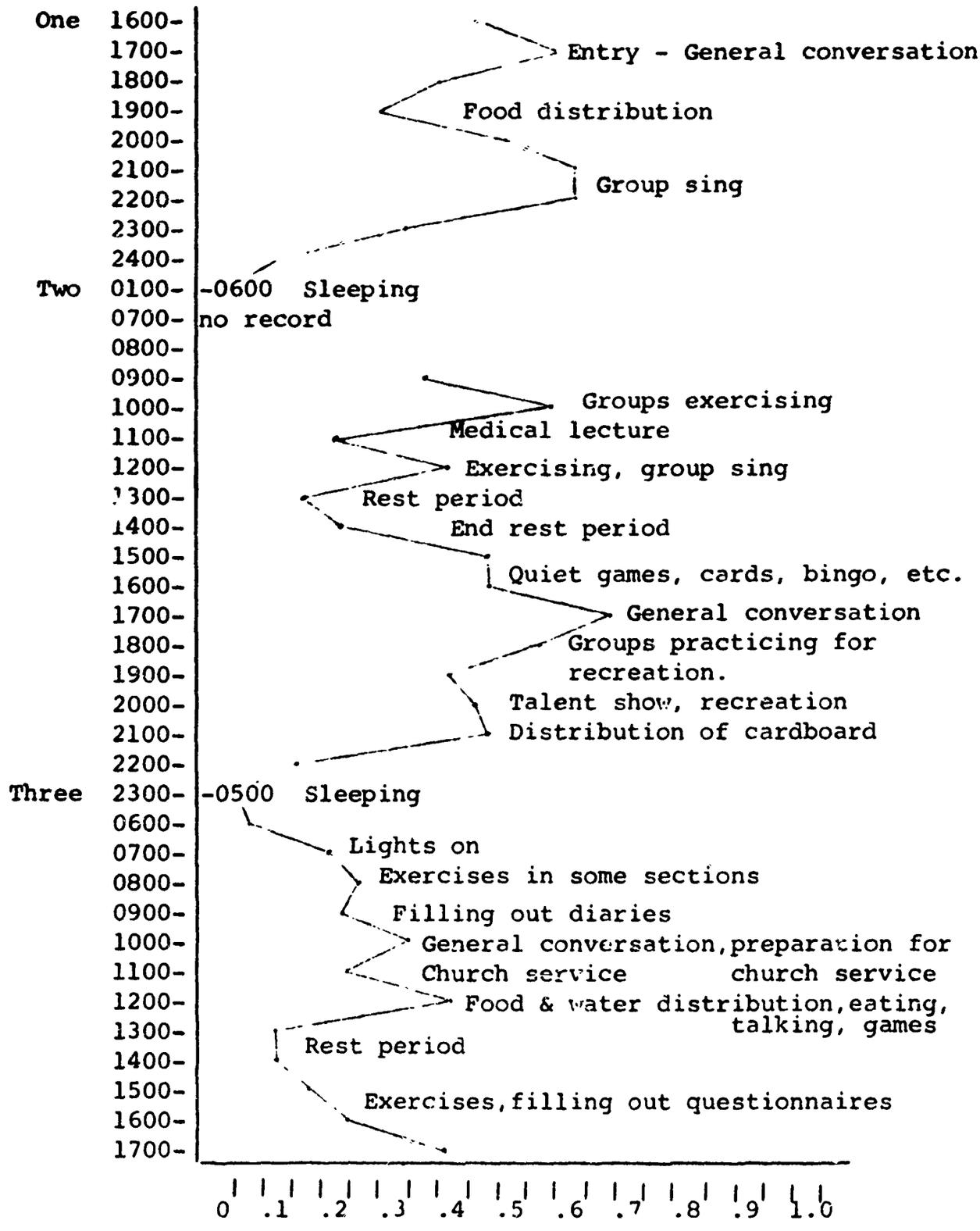

Figure 3 - Noise Level (ES VI)

IV. Conclusions

A. Shelter Staff Organization

1. The pre-selected 11-man Shelter Staff appeared adequate for management of the 300-person group.

2. There is a need for further delineation of the functions of the Shelter Staff, especially during initial phases of shelter confinement.

3. Communication among Staff members needs improvement.

B. Section Size

A 25-30 person section is manageable without further division.

C. In-Shelter Activity Program

1. Shelteree Reactions

a. Major shelteree discomforts were concerned with sleeping conditions, the chemical commode, and lack of bathing facilities.

b. Primary medical complaints were headaches and nausea.

c. Ten sq. ft. of space per person, including storage, appeared adequate for the 300-person group. However, further attention is needed in space utilization and allocation.

2. Shelteree Activities

a. Sleeping within sections was preferred over a division based exclusively on shelter-wide sexual segregation. (Families composed 75 per cent of this shelter population.)

b. Food distribution four times/day and water distribution six times/day proved to be sound procedures.

c. More consideration within the activity program should be given to the needs of younger children.

d. The nursery plan proved valuable, but needs further testing.

e. Sanitation rules need more specification and observance requires greater emphasis.

3. Training Program

The section lecture was preferred above the centralized lecture.

D. Shelter Handbook

A shelter handbook proved to be a practical need in shelter management. Present test results have indicated necessary revisions.

E. Use of Shelterees Aged 3-66 Years

1. Nausea appeared most prevalent among children who did not eat.

2. Children must be supervised in the use of toilet facilities.

F. OCD Supplies

1. The fiberboard commodes proved inadequate when the interior plastic lining ruptured.

2. To insure conservation of toilet tissue and hand cleaner, strict control is necessary.

3. The most consumed medical kit items were aspirin and phenobarbital.

4. Lack of janitorial supplies contributed significantly to the sanitation problem.

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Appendix B-1

Description of Fallout Shelter and Instrumentation

I. Experimental Shelter

The fallout shelter used for Experimental Study VI was a selected portion of a previously marked CD basement shelter. This shelter, located in the Georgia Center for Continuing Education on the campus of the University of Georgia, consisted of two rooms. One large room with an area of approximately 2500 sq. ft. was connected by double doors to a smaller room of approximately 1500 sq. ft. The floor was concrete, and the ceiling 12.5 ft. high.

Temporary walls of ½ in. plywood were installed to restrict the shelter area to 3000 sq. ft. Locations for one-way observation ports and camera positions were marked.

Six 36 in. x 24 in. x 6 ft. cubicles were constructed as latrine areas.

Outside the shelter, at one end of the larger room, was located the main observation and recording room. From this room the interior of the large room and a portion of the small room could be viewed through a large one-way vision mirror. This room, the main observation station, housed all the recording and communications systems.

See Figure B-1-1 for the location of all observation ports, camera positions, and latrines.

Illumination of the shelter was far above the normal level in order to provide adequate lighting for filming operations. This lighting consisted of 34,000 B.T.U.'s of 200-watt incandescent lamps and 12,000 B.T.U.'s of 40-watt florescent lamps for day time use. A switch panel within the shelter provided on-off shelter control of these lights. Three 15-watt lamps, which could not be extinquished, provided nighttime lighting. Fifteen-watt lamps were also used to illuminate the latrine areas.

II. General Instrumentation Specifications

A. Air Conditioning

1. The existing air conditioning unit was a small chilled water system installed in the larger room of the shelter. The only control over the output of this unit was a fan which could be switched manually.

ES VI SHELTER AREA

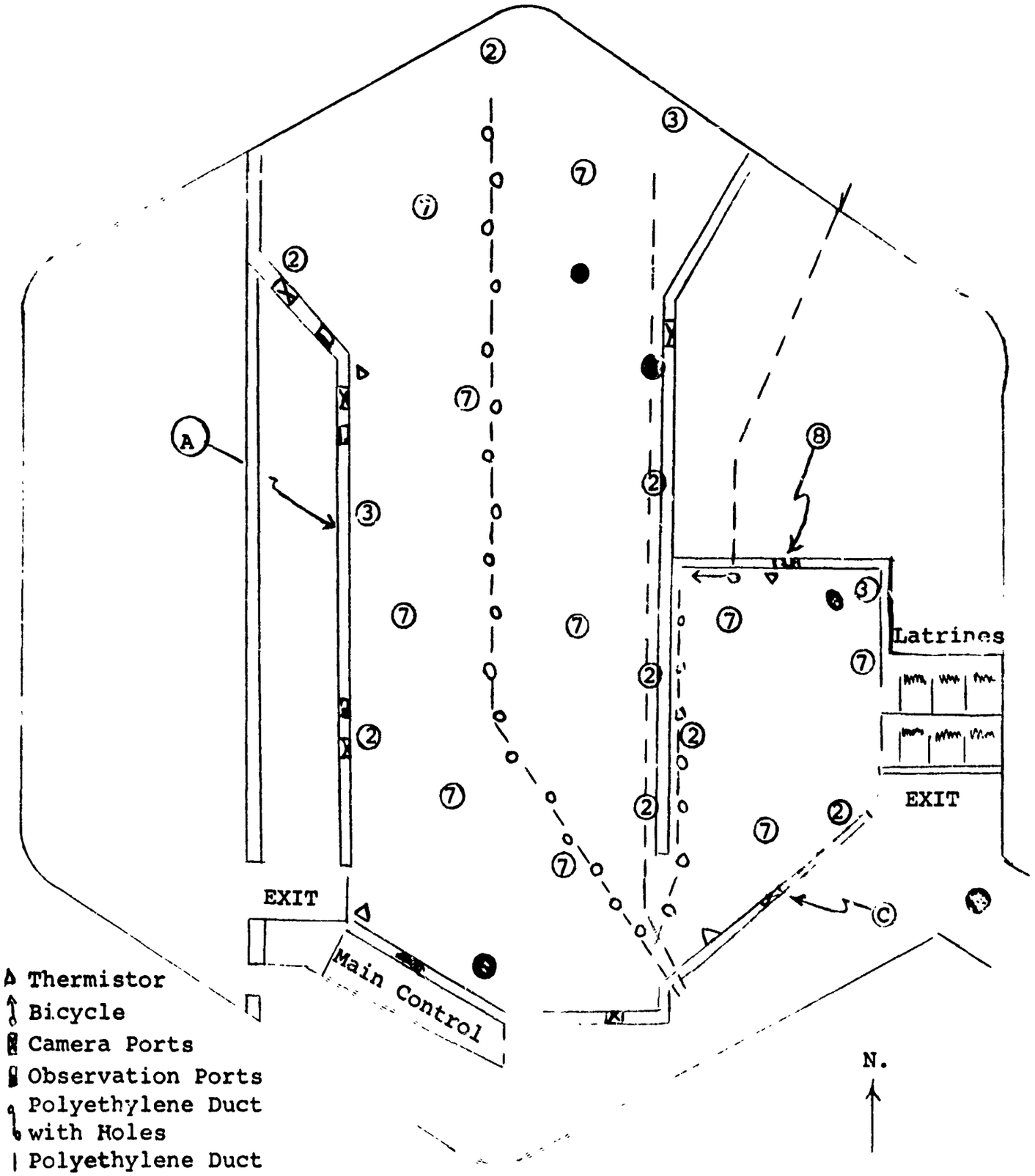

Figure B-1-1

2. Because of the desire to investigate ventilation in actual fallout shelters, the University of Georgia Shelter Occupancy Research coordinated with MRD Division, General American Transportation Corp., to provide a controlled air conditioning system that would keep the shelter at the optimal temperature, humidity, and ventilation rates.

3. MRD supplied and operated an OCD Test Vehicle #1. This vehicle contained:

a. Twenty-ton air conditioning unit capable of cooling air to 42°F.

b. 8,000 B.T.U. hot water boiler for heating air well over 100°F.

c. Air washer unit for controlling the dew point of supply air.

d. Air Control System - A system of polyethylene ducts used to distribute air flow.

- An exhaust fan and duct for exhausting air to the outside.

- An 8,600 C.F.M. blower to regulate air flow into the shelter.

e. Automatic controllers and recorders for recording and maintaining pre-set conditions.

4. A bicycle exhaust system with polyethylene tubing to the outside of the shelter was installed for testing. The bicycle was also equipped with a motor drive to replace the manual drive when desired. See Figure B-1-1 for location.

5. Two separate systems of polyethylene duct were installed in the shelter. One system consisted of 3 mil , 24-in. diameter tubing suspended from the ceiling and running the center length of the larger room. A 4 mil , 8-in. diameter duct was attached to the 24-in. duct and suspended from the west wall of the smaller room. Holes were cut approximately every 6 ft. along these two ducts to allow even air distribution.

The second system consisted of a 3 mil, 24-in. diameter tube suspended from the ceiling and ran along the east wall of the larger room. With this system, conditioned air was dumped at the north end of the larger room and allowed to flow throughout the shelter.

6. Four pre-set conditions were used during this study.

   a. The existing cooling system with outside shelter doors open for air flow.

   b. The first duct system which provided even distribution of conditioned air with outside shelter doors closed.

   c. The second duct system which dumped conditioned air into the north end of the large room and exhausted it through the bicycle duct system using the electric motor drive.

   d. No forced air flow. Used during times of changing from system b to c.

"Condition a." was used for the first few hours of the study, followed by "condition b." During the day of 1 August, conditions "c." and "d." were used, and then condition "b." used again for the remainder of the study.

Refer to report MRD 1195-57 for detailed information on air conditioning and results. This report has not been received by the University of Georgia as of this date.

Figure B-1-1 shows the location of the duct system, thermocouples, thermistors, and psychrometers.

B. Specific Variable Control and Recording

1. Temperature - Temperature variations within the shelter were recorded from twenty-four thermocouples, four thermistors, and five mechanical psychrometers. Two portable Model 566 Bendix psychrometers were used within the shelter to monitor the effective temperature.

2. Noise Level - Noise variations within the shelter were

picked up through two eight-inch speakers, serving as microphones, and located in the ceiling of each room. The speaker outputs were combined, amplified, and recorded on a one milliampere Rustrak recorder, providing a permanent graphic recording of the shelter noise variations.

The relative mean hourly noise levels for the 50 hours of confinement will be found in the text of this report.

3. Audio Recording - Seven speakers which served as microphones for picking up in-shelter lectures and conversations were mounted on the wall and in the ceiling of the shelter. These speakers were connected to a Roberts 990 stero tape recorder. Recordings were made during all waking hours of the study.

Three of these speakers were wired through a switching system which allowed them to be used as a P.A. system from the main control room into the shelter.

In addition, two highly directional microphones were used to record lectures and other specific activities in conjunction with the motion picture recordings.

Three E.E.8 telephones were installed for communication stations in the shelter, air conditioning trailer, and main control room.

Appendix B-2

Pre-Shelter Testing

Table B-2-1

Mean Raw Scores for MMPI Sub-Scales
(Experimental Study VI)

Sub-Scales	Total (N=73)	Male (N=30)	Female (N=43)
Ao	14.19	13.70	14.57
At-s	4.54	4.43	4.65
Re-r	15.28	14.13	16.26
Pd_2	3.64	4.03	3.35
Pd_3	8.17	8.37	7.98
Pd_{4A}	4.38	4.20	4.51
Hy_1	1.53	1.40	1.67
Sp	18.01	18.53	17.65

Appendix B-3

Shelter Diaries

Shelteree Diaries
(Experimental Study VI)

Shelterees filled out unstructured diary forms daily. In these forms they expressed their likes and dislikes concerning shelter living. Tables B-3-1 and B-3-2 present frequencies and rankings of these positive and negative comments, respectively, for the last two days of the three-day study. To be included in the tables, items had to be mentioned a combined number of five times on Saturday and Sunday.

The ranks for a given item on the positive and negative tables are not necessarily correlated, since several people might like one aspect of the environment while several others might dislike it intensely. Thus, the same item could receive both a high number of positive comments and a high number of negative comments.

Table B-3-1

Frequency of Positive Shelteree Diary Comments
(Experimental Study VI)

Evaluations	Saturday Freq.	Saturday Rank	Sunday Freq.	Sunday Rank
Enjoying It	53	1	20	4.5
Candy	49	2.5	16	8
Rations (in general)	49	2.5	6	10
Organization	37	4	17	7
Sleeping	35	5	42	1
People	32	6	20	4.5
Water	29	7	4	11.5
Recreation and Exercise	16	8.5	24	2
Temperature	16	8.5	8	9
Crackers	12	10	3	13
Feel Good	9	11	19	6
Toilet	7	12	1	14
Sleep Arrangements	3	13	23	3
Religious Activities	2	14	4	11.5
Totals	349		207	

Table B-3-2

Frequency of Negative Shelteree Diary Comments
(Experimental Study VI)

Evaluations	Saturday Freq.	Saturday Rank	Sunday Freq.	Sunday Rank
Sleeping (floor, etc.)	113	1	44	3
Crackers	99	2	60	2
Water	45	3	23	6
Too Cold	43	4	5	19
Space	40	5	30	5
Too Hot	26	6	17	8
Organization	24	7	8	16.5
Noise	22	8.5	11	12.5
Toilet	22	8.5	14	9
Rations in General	19	10	32	4
Smoking	16	11	6	18
No Variety in Food	14	12.5	22	7
Sick	14	12.5	70	1
Sleep Arrangements	12	14	13	10.5
Children	11	15	1	21
Personal Cleanliness	9	16	13	10.5
Recreation and Exercise	8	17	9	14.5
Lights	7	18.5	8	16.5
Sanitation	7	18.5	9	14.5
Bored	5	20.5	11	12.5
People	5	20.5	3	20
Totals	561		409	

Appendix B-4

Post-Shelter Questionnaire

Post-Shelter Questionnaire Analysis
(Experimental Study VI)

The Post-Shelter Questionnaire used in this study was similiar to those used in earlier experimental studies.

Administration

The questionnaire was administered in the shelter just prior to emergence. One hundred seventy-one subjects - eighty males and ninety-one females - all fifteen years of age or older filled out the questionnaire form. About ten of the subjects failed to follow directions when answering some of the questions, and their responses were deleted from the analysis of those questions improperly answered. Also a few subjects simply refrained from answering some questions. Although these two factors have complicated the figuring of percentages cited in this analysis, the percentages unless otherwise specified, will be based on the one hundred seventy-one subjects who filled out the questionnaire.

Adjustment to Shelter Living

In Part I of the questionnaire an effort was made to get an idea of the subject's adjustment to shelter life. The first question required that each subject estimate the number of days he could remain in the shelter under the same conditions. Table B-4-1 presents the results of this question for the males, females, and total group. For each of these groups it gives the number of subjects selecting each of the alternative numbers of days together with the total number of responses in each group and the mean and median of the estimates made by the members of each group.

The next two questions revealed a favorable attitude on the part of the subjects toward their stay in the shelter. The three questions after that showed that the subjects thought the least adjusted group in the shelter was the adults and that the best adjusted group was the young people with the children falling in between these two groups. The results of these five questions are presented in Table B-4-2. The percentages given are based on the number of subjects answering each question. The number in parentheses below each percentage is the number of yes answers composing that percentage.

The last question in Part I asked the subjects to give any items that they felt definitely should be added to the shelter

Table B-4-1

Shelteree Estimates of How Much Longer They Could Remain in the Shelter (Experimental Study VI)

Additional Days	Number of Estimates: Total Group	Males	Females
0	13	2	11
1	11	3	8
2	12	6	6
3	12	4	8
4	12	2	10
5	14	6	8
6	3	2	1
7	11	3	8
8	3	0	3
9	0	0	0
10	28	17	11
15	22	15	7
20	5	3	2
30	23	17	6
Total Responses	169	80	89
Mean Estimate	10.1 days	13.3 days	7.2 days
Median Estimate	7.0 days	10.0 days	5.0 days

Table B-4-2

Shelteree Responses to Questions
Concerning Shelter Adjustment
(Experimental Study VI)

Question	PERCENT YES		
	Total Group	Males	Females
Would you have volunteered to stay in the shelter if you had known what it would really be like?	80.2 (N=134)	83.3 (N=65)	77.5 (N=69)
Would you volunteer to stay in this shelter again sometime?	72.3 (N=120)	77.9 (N=60)	67.4 (N=60)
Do you think that many of the children find it hard to live in this shelter?	44.4 (N=75)	50.6 (N=40)	38.9 (N=35)
Do you think that many of the young people find it hard to live in the shelter?	29.2 (N=50)	25.0 (N=20)	33.0 (N=30)
Do you think that many of the adults find it hard to live in the shelter?	53.2 (N=91)	48.8 (N=39)	57.1 (N=52)

stocks, keeping in mind that cost must be held to a minimum. Although many of the suggestions were repeated by several subjects, no one suggestion was repeated enough times to constitute one-fourth or more of the total number of suggestions and their repetitions. However, three suggestions did arise, 17, 12, and 9 per cent of the time, respectively. They were more varied food, bedding and better sleep conditions, and reading and recreation materials.

Primary Discomfort Factors

In Part II of the questionnaire the questions were designed to ascertain the factors contributing to the discomfort of the shelterees. In question one the subjects were asked to choose from the seventeen factors presented, those that they considered discomforts and then to rate those factors in order of discomforts. The results of question one are presented in Table B-4-3. Questions two through twenty-one are primarily amplifications of the 17 factors of question one.

Although no factor in question one was chosen as a discomfort by more than half of the subjects, three factors were chosen by more than one-third but less than one-half of the subjects. These factors, together with a more detailed breakdown of each factor derived from subsequent questions are as follows:

Sleeping - This was the largest discomfort factor, being selected by 49 per cent of the subjects as a discomfort. A more detailed breakdown of sleep conditions comes from question eleven. This breakdown reveals four reasons for discomfort from sleeping selected by more that 25 per cent of the subjects:

Floor not soft enough	50.3%
Made parts of the body sore	40.9%
Too crowded	34.5%
No pillow	31.6%

Toilets - Forty-seven per cent of the subjects indicated this factor to be a discomfort. In question nine, having to do with the chemical toilet, two factors emerged as causing distress:

Smell (of the toilet)	39.2%
Too high	26.9%

Table B-4-3

Shelteree Indications of Discomfort
(Experimental Study VI)

Discomfort Factor	Total Group N	Total Group Mean Ranking	Male N	Male Mean Ranking	Female N	Female Mean Ranking
Sleeping	84	2.45	43	2.00	39	3.03
Toilets	80	2.96	36	3.33	45	2.84
No bathing	70	3.43	23	4.04	47	3.13
Boredom	46	4.00	25	3.32	21	4.81
No coffee	45	3.44	18	3.89	27	3.15
Dirty	45	4.27	17	3.94	28	4.46
Space	43	4.74	20	4.35	23	5.09
Noise	42	5.69	21	4.81	21	6.57
Water	35	4.91	17	4.41	18	5.39
Too cool	33	5.15	7	10.29	26	3.77
Too warm	27	3.00	14	3.00	13	3.00
Smells	26	6.69	8	8.25	18	6.00
Tobacco smoke	25	4.52	12	6.17	13	2.92
Not enough fresh air	22	6.59	11	5.64	11	7.55
Not enough tobacco	18	4.17	10	3.90	8	4.50
Shelter activities	16	6.44	10	6.40	6	6.50
Other people	12	9.75	7	10.29	5	9.00

In question ten, having to do with types of smells, the smell of the toilets was cited as a discomfort factor by 40.4 per cent of the subjects.

No bathing - This last factor was mentioned by 40.9 per cent of the subjects. From question nineteen, having to do with keeping clean, two aspects of no bathing came to the fore as causes for discomfort:

Could not wash face	33.9%
Could not take bath or shower	39.8%

In addition to the above factors chosen by more than one-third of the subjects, there were four factors chosen by more than one-fourth but less than one-third of the subjects. These four factors plus a more detailed look at each as obtained from subsequent questions are presented as follows:

Boredom - This factor was cited as a discomfort by 27.5 per cent of the subjects. The analysis of question eighteen revealed two conditions conducive to boredom:

(Lack of) reading materials	45.6%
(Lack of) recreational supplies	31.6%

No coffee - In question one, this factor was considered a discomfort by 26.3 per cent of the subjects. In question eighteen the lack of coffee was claimed a discomfort by 29.2 per cent of the subjects, a fairly close agreement.

Dirty - Twenty-six per cent of the subjects declared this factor to be a discomfort. Question nineteen points toward "had to wear the same clothes all the time" as a factor, chosen by 26.3 per cent of the subjects, which could contribute to a feeling of dirtiness.

Space - Chosen by 25 per cent of the subjects, a lack of space has a pretty self-evident discomfort capability. Question two echos question one by indicating that 29.2 per cent of the subjects indicated "not enough" (space) to be a discomfort. Also question eleven points out that the problem of space during sleep was a discomfort to 34.5 per cent of the subjects.

Other Discomfort Factors

Two other factors which were not included in question one

and yet were designated as discomforts by at least one-fourth of the subjects are as follows:

1. Crackers:

No variety	49%
Too dry	29%

2. Personal feelings:

Headaches	34%
Sore	29%

Shelter Lectures

The subjects were asked to indicate whether the lectures given to the shelter as a whole or the lectures given in the individual sections worked best. Of the 133 subjects who answered this question, 38 per cent said the lectures given to the whole shelter worked best, and 62 per cent said the section lectures worked best.

Sleep Arrangements

The subjects were asked to indicate which of the two sleeping arrangements employed during the study they liked best. The arrangement which consisted of sleeping by sections with family groups separating the single males from the single females in each section was chosen by 66 per cent of the 155 subjects answering the question. An interesting note is that 70 per cent of the same 155 subjects said that they got a better night's sleep under this sectional sleeping arrangement.

Section Size

From Part III of the questionnaire two major areas were investigated. The first of these areas was the opinion of the subjects as to the best size for shelter sections. The 168 subjects who indicated their opinion fell into the following three percentage groups:

Preferred 25 people per section	54%
Preferred 50 people per section	33%
Preferred 75 people per section	13%

Integrated Shelter

The second area investigated was the feelings of the subjects about integration in shelters. Question four asked the subjects how they felt about living in an integrated shelter. The 161 subjects who gave opinions fell into five categories. The largest group, composing 50.3 per cent of the total, felt that things had been better than they had expected. The next largest group, 33.6 per cent, said that it had been fine, just as they had expected. Still a third group, composing 13.0 per cent of the total, said that integration was all right under emergency conditions. Of the last two groups, 2.5 per cent and 0.6 per cent respectively, the first thought that it had been worse than they had expected but still all right, and the second felt that it would not do it again under any circumstances.

Question five asked pointedly whether the subjects thought shelters should be segregated or integrated. Of the 160 subjects who answered the question, 29.4 per cent felt that shelters should be segregated, and 70.6 per cent maintained that shelters should be integrated.

Summary

One hundred seventy-one subjects 15 years of age or older, took the Post-Shelter Questionnaire just prior to exit from the shelter.

The overall opinion of subjects' adjustment to shelter life was good, with the young people being deemed best adjusted, and the adults least adjusted.

Although no factor was mentioned as a discomfort by one-half or more of the subjects, factors chosen as discomforts by one-third or more of the subjects are, in order of importance: sleeping, toilets, and no bathing. Those factors mentioned as discomforts by one-fourth to one-third of the subjects are, in order of importance: boredom, no coffee, dirty, and space. The crackers, headaches, and soreness were also discomfort factors to some subjects.

About two-thirds of the subjects thought that the lectures given in the individual sections worked best.

Also two-thirds of the subjects preferred the sectional sleeping (second night) to sleeping segregated by sex (first night), and 70 per cent reported getting better sleep under the former arrangement.

Slightly over half of the subjects thought that the best size for shelter sections would be 25 people. The remainder felt that larger sections would be best.

In the area of racial integration of shelters, 70.6 per cent of the subjects felt that shelters should be integrated.

Appendix B-5

Shelter Supplies

Table B-5-1

Shelter Provisions Stocked and Expended
(Experimental Study VI)

Item	Stocked	Used or Expended	Not Expended
Medical Kit C:			
Aspirin, 5 gr.	3,000	523	2,477
Cascara Sagrada Ext., 4 gr.	600	None	600
Eugenol, 1 oz.	1	None	1
Eye & Nose Drops, ½ oz.	18	2	16
Isopropyl, alcohol, 1 qt.	6	½	5½
Kaolin & Pectin Mix., 1 pt.	6	None	6
Pencillin G, 250,000 units	1,200	20	1,180
Petrolatum, white, 1 lb.	3	None	3
Phenobarbital Tablets, ½ gr.	3,000	107	2,893
Soap, surgical, 1 3/4 oz.	36	None	36
Sodium, bicarbonate, 1 lb.	2	None	2
Sodium, chloride, 1 lb.	2	1 oz.	1 lb. 15 oz.
Sulfadiazine Tablets, 7½ gr.	3,000	40	2,960
Water Purification Tablets	600	None	600
Bandage, gauze, 2 in. x 6 yds.	72	12	60
Bandage, muslin, 37" x 37" x 52" Trian.	6	1	5
Cotton, purified, 1 lb.	3	None	3
Pads, gauze, 4" x 4"	1,200	200	1,000
Applicator, wood, cotton tipped end	600	50	550
Depressor, tongue, wood	300	25	275
Forceps, splinter, tweezer, 3½ in.	1	1	1
Pin, safety, 1½ in.	144	12	132
Scissors, blunt, 4 in.	3	1	3
Syringe, fountain, plastic	1	None	1
Thermometer, oral	4	2	4
Family Guide, Emergency Health Care Manual	3	None	3
Medical Kit Instructions	3	None	3

(Cont'd)

Table B-5-1
(Cont'd)

Item	Stocked	Used or Expended	Not Expended
Sanitation Kit IV:			
Toilet Tissue	60	23	37
Drum, fiber	6	6	0
Seat, commode	6	6	6
Can opener	6	2	6
Sanitary napkins	360	34	326
Hand cleaner, can	6	3½	2½
Gloves, polyethylene, pr.	6	6	0
Spout	6	6	6
Tie wire	6	6	0
Cups, plastic	480	389	91
Cup lids	480	345	135
Commode chemical	6	2	4
Bag, polyethylene	6	6	0
Instruction Sheet	6	6	6
Radiation Kit:			
CDV-700	1	1	1
CDV-715	1	1	1
CDV-742	7	7	7
CDV-750	1	1	1
Water Drum	60	11	49
Crackers, tin	168	9	159
Carbohydrate, tin	18	1½	16½
Additional Supplies:			
Bible (King James)	1	1	1
Shelter Management Handbook	15	15	15
Diary Form	600	599	1
Food & Water Log	100	63	37

(Cont'd)

Table B-5-1
(Cont'd)

Item	Stocked	Used or Expended	Not Expended
Commode Tag	12	12	0
Water Drum Tag	12	12	0
Fire Extinguishers			
a. CO_2	1	None	1
b. Sodium Water	1	None	1
c. Foam	1	None	1
Corrugated Fiberboard	3,000 sq. ft.	3,000 sq. ft.	3,000 sq. ft.
Medical Complaint Record	50	22	28
Defection Report	100	None	100
Night Water Record	20	3	17
Registration Form	371	300	71
Pencil	300	51	249
Note Pad (legal size)	11	3/4	10¼
Ball Point Pen	11	3	8
Arm Band	4	4	4
Carbon Paper	12	None	12
Post Shelter Questionnaire	181	178	3
RAD Monitor Course Book	2	2	2
SM Designation Form	2	2	2
Light bulbs, 300-watt	8	1	7
Scotch Tape	1	None	1